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ROCKS AND MINERALS

Official Journal of the Rocks and Minerals Association

A Magazine for Mineralogists, Geologists and Collectors

JANUARY - FEBRUARY, 1949

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60c

28th LIST OF FINE MINERALS

BARITE, Cumberland. Deep yellow xls. in parallel position. 3½x2 ..... $3.50
BISMUTH, Cobalt. Xlline. mass. 1¼x¾ (1 oz.) 1.00
AZURITE, Tsumeb. Superb brilliant xls. in matrix. 3½x3x1½ 25.00
APATITE, Maine. Very good deep lilac tabular xls. in rock. 3x2½x2 ..... 7.50
PYRITE, Franklin, N. J. Brilliant modified ⅜" xl. in Calcite. 2x2 ..... 1.50
ZIRCON, Ontario. Huge reddish-brown opaque xl. 3½x1¼x1 (10 oz.) ... 6.00
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PHARMACOLITE, Germany. Minute radiated tufts w. Siderite on rock. 3x2. 3.00
MALACHITE, Bisbee. Xld. in limonitic ore. 3x2x2 ..... 2.00
ALLANITE, South Mt., Pa. Xlline. mass with some xl. faces. 3x1½x1½ ... 2.00
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PSITTACINITE, Tsumeb. With Cuprodescloizite. Small botryoidal. 3x2 .... 3.00
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GMELINITE, Great Notch. Fine xld. mass without rock. 4x3½ 5.00
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STICHTITE, Tasmania. Lilac masses in green Serpentine. 4x2½ 3.00
AXINITE, Franklin, N. J. Deep yellow xlline. mass w. Garnet. 2x1½ 3.00
QUARTZ, Herkimer Co., N. Y. Doubly term. ¾" xl. in rock. 3x2½x2 .... 2.00
TIEMANNITE, Clausthal, Harz Mts. Coating on rock. 2x1 ..... 2.00
EUXENITE, Madagascar. Xls. in par. position, altered on surface. 1x1 ..... 2.50
MICROLITE, Newry, Me. Yellow xl. about ½" in Spodumene. 3x1½ 2.00
GALENA, Utah. Highly mod. xls. w. TETRAHEDRITE xls. etc. 5x3x2½ ... 7.50
MAGNESIOLUDWIGITE, Utah. Xlline. mass. 4x2½ 2.00
SMITHSONITE, Joplin. Col. yellow by Greenockite, small botry. 3x2½ 2.00
TORBERNITE, Czechoslovakia. Xlline. scales on rock. 3x2 ..... 2.50
SPHENE (TITANITE), Switzerland. Xld. w. Adularia & Chlorite. 4x2 ..... 6.00
FRANKLINITE, Franklin. ¾" xl. w. smaller xls. in Calcite. 2x1½ 1.50
SMALTITE, Cobalt. Solid mass. 3x1½x1½ (20 oz.) 2.00
CYLINDRITE, Bolivia. Xlline. mass with typical "cylinders". 2½x2 ..... 3.50
MANGANOSITE, Franklin. Xlline. masses with Zincite. 4x2 ..... 4.00
WAVELLITE, Co. Cork, Eire. Globular, dark green, radiated. 3x2½ 1.50
HEULANDITE v. BEAUMONTITE, Jone's Falls, Md. Xld. on rock. 2½x2½ 1.25
EOSPHORITE, Maine. Minutely xld. in cavity of Albite. 3x2 ..... 3.00
ANDRADITE, Vasko, Hungary. Yellowish-green xls. on rock. 3x2 ..... 2.50
CORNETITE, Bwana M'Kubwa, N. Rhodesia. Micro. xld. on rock. 2x2 .... 2.00
WOLFRAMITE, Madison Co., Missouri. Xlline. blades in Quartz. 3½x2 .... 2.00
COLUMBITE-TANTALITE, Topsham, Me. Pure xlline. mass. 3x2x1 (16 oz.) 2.50
CINNABAR, Terlingua, Texas. Impregnating rock. 4x3 ..... 3.00
BOURNONITE, Felsobánya. Small brilliant xls. on 2 sides of rock. 3x3 ..... 6.00
APOPHYLLITE, Paterson, N. J. Brilliant glassy xls. on rock. 3x2½ 3.00
BERYL, Haddam Neck, Conn. Large pink xl. w. green interior, not perfect but showing numerous sharp faces. Not cuttable. 4x3x2 ..... 3.50
CASSITERITE, Ehrenfriedersdorf. Black xls. on rock. 2½x1¼x1½ 3.00
HEMATITE, Cumberland. Brilliant small black xls. on mass. 4x2 ..... 3.00
HEMATITE, Mte. Somma, Vesuvius. Micro. xld. on lava. 4x3x2 ..... 3.00
FLUORITE, France. Grp. of naturally etched blue xls. w. Quartz. 4x3 ..... 2.00
PHENAKITE, Brazil. One inch transparent twin xl. w. some inclusions 3.50

HUGH A. FORD

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No lists furnished, but enquiries for specific minerals welcomed.

Science Direct

ROCKS and MINERALS

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ROCKS and MINERALS PEEKSKILL, N. Y., U. S. A.

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CHIPS FROM THE QUARRY

Mr. Truman, President!

We voted for Governor Dewey. We were so confident he would win that when returns showed President Truman was on top, we were dumbfounded. We cannot understand it yet. Now that it is all over we must admire the courageous fight put up by President Truman when the odds seemed so heavily against him. The whole country admires him now for America loves a great fighter and it also honors Governor Dewey, a good loser.

In summing up the situation, we cannot say that Governor Dewey lost, nor that President Truman won. But what we can say is that *America* won, for it is far better to have a Democrat in the White House and a united America in back of him, than to have a Republican president with a divided America.

Peter Zodac

Dr. Fisher Plans Long Tour

Dr. Lloyd W. Fisher, head of the Department of Geology, at Bates College, Lewiston, Me., will be on sabbatical leave during the second semester, beginning February, 1949. He plans to travel down the Atlantic seaboard visiting outstanding mineral deposits; obtaining color photographs for use in college classes; visiting some of the dams that are now being built in the Tennessee Valley and on which he did the geology in 1928-1929. He plans also to drop in on colleges at which there are departments of geology to see methods of teaching and equipment. His trip may swing westward along the gulf coast and he may get over as far as central Texas.

Dr. Fisher, a member of the R.&M.A., had a most interesting article on "Vesuvianite," in the last issue of *Rocks and Minerals,* and another "Color Photography of Minerals" is scheduled to appear in the March-April, 1949, issue. We hope that on his coming trip he may run across some interesting minerals or some unusual rock formations which might induce him to prepare another article for us.

During Dr. Fisher's absence, Daniel B. Krinsley, M.S., of Brown University, will conduct the Department of Geology at Bates College.

Dr. Willems Donates Fine Beryl Gem To Museum

A large Brazilian golden beryl of excellent gem quality and high intrinsic value was recently received by Chicago Natural History Museum as a gift from Dr. J. Daniel Willems, of Chicago. Weighing 341½ carats, the stone is beautifully cut to bring out all the natural brilliance for which beryls are so well known. It has been added to the exhibits in H. N. Higinbotham Hall (Hall 31).

Dr. Willems, a member of the R&MA and one of America's famous amateur gem cutters, is the author of the new book, "Gem Cutting," which is having a wide circulation.

Yes, It Is Terrible!

Editor R. & M.:

That's terrible!- Here I thought that at last we had a good mineral magazine and now you have to spoil it all by bringing it out once every two months. Of course I don't know about the business part of it—all I know is that it isn't good for Rockhounds.

Frank Morse,
Nov. 1, 1948 Bayfield, Colo.

Plea for Preservation Of Pot-Holes!

Editor R & M :

That article "Water-Bored Pot-Holes Uncovered in Bed of Drouth-Parched Susquehanna," in the Jan. 1948, issue of *Rocks and Minerals* sure was a fine one. Too bad my attention to this fine article was not called sooner or I would have gone to see the pot-holes. Now this country is full of National Monuments calling attention to interesting natural wonders. Why could not this section of the river bed be made into a Monument? Could not a concrete coffer dam be built around it so visitors could view this wonderful piece of God's handycraft? You as a former engineer would know if this is possible. All the mineral societies of the U. S. should work together to have the government set this aside as a point of interest, especially being in the east where the greatest concentration of population is located. Most of our National Parks and Monuments are out west.

Rud Pohli
R. D. Petersburg Rd.,
Hackettstown, N. J.

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"ATOMIC ENERGY AND THE MINING BUSINESS: AN INVITATION"

Remarks of JOHN K. GUSTAFSON
Director of Raw Materials, U. S. Atomic Energy Commission,
before the American Mining Congress at San Francisco
on September 23, 1948.

I am thankful for this opportunity to address you on behalf of the U. S. Atomic Energy Commission. My job primarily is to provide the Commssion with the uranium ore it needs for its program of bomb manufacture and research and ultimate power development. My problems are mostly the kind of problems with which you are familiar. They have to do with geological exploration, engineering and cost estimates, mine development and the treatment of ore in mills or chemical plants to make high-grade concentrates. So far as it can be done, consistent with national security (which we try hard to define sensibly) we want to explain our raw materials program to *you,* the mining industry. We want you to understand it. More than that, we want you to take an active interest and an active participation in that program. The Commission firmly believes that the discovery, development, and production of uranium ores by and large can best be accomplished by competitive private enterprise under the stimulus of profits. Our objective is to get you into the atomic energy business on that basis.

Let me review very briefly what this atomic energy business is. When a strange bomb exploded with such devastation over Hiroshima on August 6, 1945, and, a few days later, another similar bomb brought wholesale death to Nagasaki, the whole world knew what a few of our nuclear physicists and military men, secretly proved earlier in a deserted region of New Mexico, and what scientists in laboratories all over the world predicted could be done. Man had finally mastered and used for destructive purposes the awesome forces within the atom. A continuing chain reaction of nuclear fission had been sustained and controlled. With those explosions disappeared much of the smoke screen of secrecy that had been so amazingly preserved around the gigantic and seemingly fantastic efforts put forth by this country, the United Kingdom, and Canada in the development of the atomic bomb. The Smyth report and other publications, including the Commission's semi-annual reports to Congress, have revealed to the public much about the multi-million dollar installation at Oak Ridge, Tennessee, where the fission-able isotope uranium-235 is separated from non-fissionable U-238, which is 140 times as abundant in natural uranium; the multi-million dollar Hanford plant near Richland, Washington, where non-fissionable uranium-238 is converted into fissionable plutonium through the absoption of a neutron; the great installation at Los Alamos in New Mexico where weapons are made; and the various intermediate chemical plants that produce uranium salts or the uranium metal required in these processes. The nuclear reactors or "atomic piles" now operating or scheduled for construction at Los Alamos, Hanford, Brookhaven, Chicago, Schenectady and Oak Ridge and the great research projects in both biology and medicine and the physical sciences that the Commission has undertaken have all been mentioned or described in official reports and in the daily press.

In the world as it is today, much of

the operations must be devoted to producing weapons to safeguard this nation's security. Eventually, these or better facilities may be devoted to the production of industrial power. Then the atomic age will have truly arrived. One thing is certain. Atomic energy will continue in ever increasing measure to play a part in our lives and the lives of our descendants. It is here to stay. Uranium producers seem assured of a market for their product.

At least to you who are trained in the mining industry the raw materials end of this complex business is the more understandable and perhaps less glamorous, if no less obviously important. You have seen gold and lead and copper ore bodies die in depth; and you know new mines must constantly be found if big concentrators and big smelters are to be kept running. Our plants at Oak Ridge and Hanford are no different in this respect; and high-grade uranium deposits are not notable for their continuity. Moreover, we depend heavily on foreign ores, and in a troubled world that is not the happiest situation to be in. This is our reason for wanting American miners to find and produce uranium in this country.

Let us examine for a moment the source materials situation of the world. Uranium composes about .0004% of the earth's crust, but it occurs very sparingly in significant concentrations. There are five major classes of uranium deposits which are being exploited now or will be exploited in the future:

1. High-grade hydrothermal pitchblende-radium deposits, occurring as replacement bodies in shear zones. (By high-grade I mean assaying better than 1% U_3O_8, over a mining width.) Where oxidized, the ore consists of autunite, carnotite, and other oxidation products of pitchblende many of which are brightly colored. The better known deposits of this kind are Eldorado in Canada; Shinkolobwe in the Belgian Congo (from both of which the United States obtains uranium); and Joachimstahl and other deposits in the Erzgebirge of Czechoslovakia and Germany which according to newspaper accounts Russia is now exploiting. Deposits of this class may contain appreciable quantities of silver, shale or phosphate industries may play a part in the development of atomic copper, or cobalt.
2. Carnotite-type and roscoelite-type vanadium-uranium ores of the Colorado Plateau. These closely related ore types are apparently important only in this country, but at best they are quite inferior to the high-grade ores as a source of uranium. These multiple small lenticular deposits occurring in flat-lying sandstones are under active development at the present time as part of the Commission's program. Ore acceptable at our ore purchase depots contains a minimum of 0.10% U_3O_8, and payment is made for V_2O_5 content in a ratio not exceeding 10 parts V_2O_5 to one part U_3O_8. By-product uranium from privately owned vanadium plants is also purchased by the Commission.
3. Gold-uranium ores of the Witwatersrand, South Africa. Public announcement has recently been made of the occurrence of uranium as a very minor constituent of the gold-bearing Witwatersrand conglomerate. The intriguing prospect exists therefore of future by-product uranium from the great gold mining industry of the Union of South Africa. The Commission, through the U. S. Geological Survey, has for some time been systematically examining all the mill and smelter products in this country to discover if similar by-product possibilities exist here.
4. Uranium-bearing oil shales and other marine sediments. It has long been known that certain oil shales and other marine sediments, including phosphatic beds, contain very small quantities of uranium. Sweden, for example, has announced that she is building a small atomic pile and intends to derive uranium from her oil shales to feed this pile. According to published statements Swedish shale deposits containing many millions of tons of "ore" run around 0.02%

U_3O_8. (These same geological formations extend northeastward up through Estonia and Leningrad.) Thus by-product uranium from oil energy in different parts of the world. I can assure you that every possibility of this character in the United States will be exhaustively examined.

5. Miscellaneous other deposits. In this grab bag come pegmatites containing small amounts of pitchblende, placers containing a little uranium (generally as thorianite) along with monazite, and other ore types of as yet, at least, minor importance.

It should be remembered that man has only just begun to look seriously for uranium. Accordingly it would not be surprising if discoveries of new types of deposits or discoveries of important deposits of types are now considered unimportant were made in the next decade. Somewhat tempering optimism concerning the discovery of important new high-grade deposits are the facts, first, that all of the known high-grade deposits were formerly important radium mines and, second, that their outcrops were conspicuous gossans.

Except on the Colorado Plateau, where the ores were worked and developed primarily for their vanadium content and where the Manhattan Engineer District purchased by-product uranium during the war, private industry in this country was until very recently inhibited from working or developing uranium ores; to some extent this was due to the uncertainty that has existed with respect to pricing, the provisions of the Atomic Energy Act, and the unusual circumstances of secrecy which surround this whole project. On April 11 of this year, however, the Commission announced a three-point program to stimulate the discovery and production of domestic uranium by private competitive enterprise. The major elements of this program are:

1. Government guaranteed 10-year minimum prices of $3.50 per pound of contained U_3O_8 for small lots of domestic refined uranium, and of $3.50 per pound of recoverable U_3O_8 less refining costs for small lots of ore or mechanical concentrates assaying at least 10% U_3O_8, both prices f.o.b. shipping point.
2. A bonus of $10,000 for the discovery of a new deposit and production therefrom of the first 20 tons of uranium ore or mechanically-produced concentrates assaying 20% or more U_3O_8.
3. Government-guaranteed 3-year minimum prices for the low-grade carnotite and roscoelite-type uranium-vanadium ores of the Colorado Plateau area and Government operation of two vanadium-uranium plants in that area.

There may some day be established a world price for uranium comparable to the price for gold, but at present there is no such price. Except for the minimum prices for domestic uranium offered by the U. S. Atomic Energy Commission and the roughly equivalent minimum price offered by the Canadian Government of $2.75 per pound of contained U_3O_8 in ores or concentrates assaying at least 10% U_3O_8 f.o.b. railhead, there have been to my knowledge no publicly announced prices for uranium since the development of atomic energy. Since uranium is everywhere controlled by the governments of the countries in which it exitst, it is unlikely that it will ever appear on free competitive world markets in the sense that lead or copper does. In this connection your attention is called to the fact that the Commission's 10-year guaranteed minimum price for domestic uranium is in fact a *minimum* price. Where larger quantities are involved than the small lots for which this price was established, or under special circumstances, we are prepared by negotiation to establish higher prices which will take into consideration special milling and refining costs, transportation costs, and other applicable factors.

Our domestic uranium program is rapidly taking shape in the Colorado Plateau. We are buying ore through our agent, the American Smelting and Refining Company, at Monticello, Utah, and get-

ting ready to do so at Durango, Colorado. Privately owned vanadium plants are now in operation and are selling us the uranium by-product. A comprehensive geological study including diamond drilling, by both the U. S. Geological Survey and AEC is well advanced. Research on improved methods of ore treatment for uranium extraction is in progress. By mid-1949 we expect to have the Government-owned Monticello plant in operation and at a somewhat later date, if ore deliveries warrant it, the Government-owned Durango plant. The vanadium companies in this field and numerous other independent operators are exploring and developing mining properties or are getting ready to do so. Ore purchases in this area under the three-year minimum guarantee are as follows for ore assaying 0.2% or better:

A price of $0.31 per pound of V_2O_5 up to 10 pounds of V_2O_5 for each pound of U_3O_8.

A basic price of $1.50 per pound of U_3O_8.

A development allowance of $0.50 per pound of U_3O_8.

A further allowance of $0.50 per pound of U_3O_8.

A premium of $0.25 per pound for each pound of U_3O_8 in excess of 4 pounds per short ton and an additional premium of $0.25 for each pound in excess of 10 pounds.

A haulage allowance of $0.06 per ton-mile up to 100 miles.

Thus, an ore containing 2% V_2O_5 and 0.2% U_3O_8 produced 50 miles distant from a purchase depot would be paid for on delivery at the rate of $25.40 per ton.

I believe that basically what should be done on the Colorado Plateau is being done or will be done. The operators in that district during the war dealt with Metals Reserve Company with respect to vanadium and with the Manhattan Engineer District with respect to uranium. They know the ropes (and the red tape) of dealing with the Government. To the rest of you, in other areas who may get into the uranium business—and I hope you will—here are some of the rules of the game and procedures: You can see that they are not formidable.

1. Uranium in deposits on the public lands, and other lands owned by the United States, is now reserved to the United States, subject to mineral rights established on or before August 1, 1946 (the date of the Atomic Energy Act). However, the Commission's guaranteed minimum prices have been made applicable to deliveries to it of ores containing such reserved uranium in consonance with the Commission's authority to pay fair and reasonable sums, including profits, for discovery, delivery, and other services performed with respect to such ores. The Commission also wishes to encourage prospecting for new deposits of uranium ores on the public domain and has been advised by the Department of the Interior, which administers the disposition of the public lands, that valid locations may be staked on such deposits if the uranium occurs in a deposit which is valuable because of other minerals. In the unlikely event of the discovery of a deposit of uranium-bearing ore which does not contain some other valuable, mineral, the Commission upon notice, will take steps to protect the prospector's equity. Uranium in deposits on lands in private ownership to which title was granted prior to August 1, 1946, belongs to the owner of the land. Such uranium, like uranium on the public lands, however, is subject to licensing procedures that I shall mention later.

2. If you have a sample of material, other than carnotite-roscoelite ore of the Colorado Plateau, which you suspect may contain uranium, you may send it to the New York Office of the Division of Raw Materials of the U. S. Atomic Energy Commission for free examination and analysis—or, of course, you may send it to any U. S. Bureau of Mines laboratory or to any assay office if you prefer. Unfortunately, the AEC analytical facilities are overcrowded and you may not

get a reply for 2 to 3 weeks if you send it to us. The AEC has an office at Grand Junction, Colorado, to which any queries concerning the Colorado Plateau region should be made and to which any ore specimens from that district should be sent.

3. Although we are trying systematically to examine and appraise every potential source of uranium in this country, we do not have the personnel to make examinations of properties on request unless there is good reason to believe that the properties in question have real merit. We hope that private consulting geologists and engineers and mining companies will play the same role here that they play with other types of deposits.
4. Anyone with uranium for sale to the Government should get in touch with the Division of Raw Materials in Washington and discuss a contract. We shall want first to have samples of the ore sent on to our New York Office for examination and analysis. We are prepared to give consideration in exceptional cases to making advances against production similar to the advances made by Metals Reserve Company during the war. In such cases the request for an advance should be accompanied by a comprehensive report of the property and of the proposed scheme of operation and should include a financial statement of the operator.
5. As required by the Atomic Energy Act, the Commission licenses all transfers of source material after its separation from its place of deposit in nature. The term "source material" means any material except fissionable material containing 0.05% or more of uranium and/or thorium. Consequently, you must apply to the Commission for an appropriate license if you want to buy or sell uranium or thorium ore after it has been mined. Distributors and processors of source material are also required to fill out a simple form each month so that we can keep track of how much there is and where it goes.
6. The most onerous part of geting involved with atomic energy is "security". Foreign nations' intelligence branches having access to total figures of U. S. uranium supply could estimate with fair accuracy the fissionable material production of this nation. Consequently, the Commission preserves secrecy concerning the actual production and reserves of uranium available to the United States. The Atomic Energy Act requires that persons having access to restricted data must first have formal Commission clearance based upon an F.B.I. investigation. There are also formal procedures that must be followed in handling "classified" letters, reports, and the like. Now, it is not necessary to be bothered with any of these things if you are a miner on the Colorado Plateau merely selling ore to the Commission; such sales are not "classified". But if you got into large production and produced uranium concentrates, then you would be subject to such security measures as I have mentioned. I can assure you that we will make your dealings with the U. S. Atomic Energy Commission as painless from the standpoint of bureaucratic procedures as the laws of our land and the necessity for maintaining secrecy covering our plant feeds will permit.

Thorium has long been recognized as a potential source of fissionable material. Consequently, it like uranium, was placed under the control of the Atomic Energy Commission by the Atomic Energy Act of 1946. At the present time, however, contrary to popular belief here and abroad, the only use the Atomic Energy Commission has for thorium is for research purposes, and its use for these purposes is very limited. The only thorium the Commission purchases is in the form of thorium salts. The Commission does not buy monazite, the principal ore of thorium, which occurs in river placer and beach

sand deposits in company with other heavy minerals.

There is, nevertheless, a considerable demand for monazite by the rare earths industry especially since embargoes have been placed on monazite by India and export sales in Australia are restricted. Most of the monazite is currently being purchased by the industry from Brazilian producers through normal commercial channels. The only role that the Atomic Energy Commission plays in these commercial transactions is one of licensing in accordance with the Atomic Energy Act of 1946. Any person wishing to transfer, deliver, export or receive source material must apply to the U. S. Atomic Energy Commission, 70 Columbus, Avenue, New York, New York, for a license.

What the future role of thorium may be in the development of atomic energy is difficult to say at this stage. Many experts believe that the very complex research problems standing in the way of its utilization will eventually be solved. Until this occurs, thorium will not be in demand as a fuel for nuclear reactors.

One of the bottlenecks in atomic energy work is the difficulty of assaying for uranium and thorium. A great amount of research has been done and is still being done by the Commission on analytical methods. Some methods are classified and are not available to the general public. Other methods are not classified and are available to the public. I know that there are a number of state and university laboratories and private assay offices that would like to have additional information concerning the use of radiation detection instruments and chemical assay methods. In order to help them, the Commission is arranging with the U. S. Bureau of Standards to issue an assay manual describing approved procedures for determining the uranium and thorium content of ores by means of wet assays and the use of laboratory radiation detection instruments. We propose further to send an experienced chemist and instrument operator to demonstrate unclassified methods of analysis to qualified laboratories and assay offices provided we receive sufficient requests for such assistance in reply to questionnaires which we are mailing to them.

A possible deterrent to the discovery of new deposits of uranium is the fact that few prospectors, geologists, or engineers today know much about uranium ore occurrences or are familiar with the new techniques required to appraise them. In order to overcome this deficiency the Commission has arranged with the U. S. Geological Survey for future publication of a "Prospectors' Guide". This guide describes uranium ores and the approved methods of prospecting for them. It explains, too, such things as the requirements under the Atomic Energy Act with respect to staking claims and procuring licenses from the Commission. I am sorry that I cannot pass these books out to you today. We propose also to help universities and museums to acquire suites of typical uranium and thorium ores so that students, prospectors, and all interested persons can readily become familiar with what the Atomic Energy Act calls "source material".

Today there have been and there are still on display in the Exhibit Hall, uranium ores and uranium products from different parts of the world and also a number of modern radiation detection instruments. Mr. F. W. Stead of the U. S. Geological Survey, who is one of the relatively few experts on these matters, is in charge of the exhibit and will be glad to explain these things to you. Available also at this same place are various circulars and press releases of the Commission relating to raw materials as well as copies of the Atomic Energy Act of 1946. I urge you to read these papers. As members of the mining industry and as citizens of this country, I think you owe it to yourselves to do so. After you have read them and have considered our raw materials program, I would greatly appreciate receiving from you at any time letters criticizing our raw materials program and advising me what you think ought to be done about it. After all, as citizens of this country, it is your Commission. Also, your dollars and your lives are at stake.

POSSIBLE DRAINAGE CHANGES IN THE LEHIGH VALLEY AS SUGGESTED BY AN INVESTIGATION INTO THE ORIGIN OF LEIBERT'S GAP IN THE READING HILLS.

By RICHMOND E. MYERS
Geology Department, Muhlenberg College

THE PROBLEM. Leibert's Gap, a break in the Reading Hills front, immediately southwest of Emmaus in Lehigh County, Pennsylvania, has for many years aroused considerable speculation regarding its origin. Other than suggestive hypotheses by Borhek[1] and Williams[2], no definite explanation has ever been offered to explain the presence of the opening.

Further to the east, a similar though larger opening in the same front (Saucon Gap), has also aroused speculation. In the light of the present investigations, both of these gaps appear to have very similar histories, and the origin of one is intimately associated with that of the other.

It is the purpose of this paper to show that they are both remnants of a former drainage system, and not the works of the streams that occupy them at the present time.

[1] Borhek, H. T., "An Attempt to Determine the Preglacial Course of the Monocacy", unpublished thesis, Lehigh University, 1899.
[2] Williams Jr., E. H., "Kansas Glaciation and its Effects on the River System of Northern Pennsylvania", Wyoming Historical and Geological Society Proceedings, Vol. 7, 1902.

DESCRIPTION OF LEIBERT'S GAP

Leibert's Gap forms a prominent feature in the landscape as a distinct break in the otherwise unbroken wall of the Reading Hills front. Through it Leibert's Creek flows northward into the Lehigh Valley. This gap is the only low break in the front between the Saucon Gap just east of Bethlehem, and the Schuylkill River passage through the hills at Reading. At its central point the floor of Leibert's Gap is about 475 ft. A.T., and the tops of the ridges on the eastern and western sides are 940 ft. A.T., and 700 ft. A.T. respectively. The distance between the summit points is 1.3 miles. The center of the gap is occupied by a gorge 1000 ft. long and 500 ft. wide. Through this deeper valley the stream flows. The eastern side of this gorge is quite precipitous, but it flattens out as it reaches an elevation of 600 ft., and then rises gradually to the summit at 940 ft. (See Fig. 1) Thus we actually have one gap within another. The lower or bottom gap we shall designate as the inner gorge.

Leibert's Creek flowing northward through this gap is a small stream with

PROFILE OF LEIBERT'S GAP
B-B' = UPPER GAP
A-A' = INNER GORGE

FIGURE 1

youthful characteristics. It is still dominantly downcutting, and the upper gap is suggestive of lateral cutting. The upper gap moreover appears too large to have been cut by so small a stream, but the inner gorge may well be the product of the present drainage. Thus one may assume two cycles of erosion at Leibert's Gap, the present cycle, producing the inner gorge, and an earlier cycle in which the wider upper gap was cut.

GEOLOGY OF THE AREA IN THE IMMEDIATE VICINITY OF LEIBERT'S GAP

The Reading Hills, composed of pre-Cambrian gneiss and Cambrian quartzite, are located along the southern limit of the Valley and Ridge Province, which immediately in front of the hills is composed of Cambrian limestone. The normal sequence of the column, as seen elsewhere along the front, consists of the Cambrian Hardyston formation unconformably flanking the pre-Cambrian gneiss of the hills and dipping out into the valley with the Cambrian limestones lying on top of it.

At Leibert's Gap however there are departures from the normal, and ample indication of faulting. Detached outcrops of the gneiss occur a considerable distance out in the valley north of the front, as well as at a point directly south of the gap. In both cases the outcrops are separated from the main body of the gneiss that forms the frontal ridge. Iron mines on both sides of the gap may indicate the location of faults with subsequent deposition of ores along the fault planes, as suggested by B. L. Miller[3]. The presence of numerous springs may be taken as additional evidence of faulting, and an isolated block of the Hardyston, well out of place near the summit of the east ridge, is also indicative of displacement. Lack of sufficient exposures renders the construction of geological map somewhat open to dispute (as the observable evidence may lend itself to several possible interpretations). One difference of opinion has been as to whether or not the Hardyston crosses in front of the gap. It has not been observed in that position, but neither has any other formation. Recent excavations (1941) have shown that the Hardyston is much closer to the front of the gap than previously mapped.

Another difference of opinion concerns the floor of the gap. Some workers assign it to the Cambrian, others to the pre-Cambrian. Those placing it in the Cambrian are at odds as to whether the Hardyston or limestone should be mapped there. Those favoring the pre-Cambrian carry the gneiss across the gap. Evidence favoring the Hardyston is present. Limestone has been postulated on the basis of the iron mines on each side of the gap, but a thorough search on the part of the author of this paper, as well as many of his students, has failed to bring any limestone to light on the dumps of the old mines. Descriptions of the mines by early workers fail to show any conclusive evidence that the mining operations were in limestone. Indications are rather that the mines were opened either in the Hardyston, or along contacts of the Hardyston with the gneiss. If this is so the Hardyston is faulted down into its present position, for the location of the mines, particularly the one on the west side of the gap, is way out of the normal position of the Hardyston. Those favoring the gneiss as the flooring formation base their contentions on the evidence that it is well exposed on both sides of the gap, plus the fact the Leibert's Creek is littered with boulders of the gneiss all along the gorge. These boulders however may well be talus, and they are not entirely made up of blocks of gneiss, for a number of Hardyston boulders are scattered among them.

Regardless of these differences in mapping, one thing is certain, faulting did occur in and around the gap, and on a fairly large scale. An examination of the frontal ridge of the Reading Hills will show additional displacement of an apparent horizontal as well as vertical type. A general southward sag is evident with Leibert's Gap at the bottom of the sag, and a progressive rise in summit elevations westward to Topton and eastward to the Lehigh Mountain south of Allentown. (Fig. 2)

[3] Lehigh County, Pennsylvania Geological Survey, Bul. C-39, 1941.

EVIDENCE SUGGESTIVE THAT A LARGER STREAM THAN THE PRESENT LEIBERT'S CREEK CUT THE UPPER GAP.

Here we have a small stream flowing north through a gorge in a much wider gap, which in turn is centered in an obvious zone of weakness. These, and other conditions may well lead one to postulate a much larger stream occupied the opening known as Leibert's Gap. Let us examine this possibility in detail. In an earlier paper[4] it was shown that the ideas of former workers (Borhek and Williams) involving glaciation as a factor in the Leibert's Gap problem were unlikely, but their suggestion that the gap may have been the work of the Lehigh River has led to further investigations.

At the points where the major streams flowing from the Lehigh Valley through the Reading Hills enter the Triassic, large deposits of conglomerate occur. These are Triassic in age. They may be seen at Monroe along the Delaware River, and at Robesonia south of Reading along the Schuylkill River. These conglomerates have been described as fanglomerates by McLaughlin[5] and others, and the writer concurs with this opinion. They are composed of cemented fragments ranging from coarse sand granules to cobbles and small boulders. In some areas these fragments are mainly limestone, in others sandstone and quartzite predominate. Elsewhere they are intermixed. Pieces of shale and gneiss are present but never in large amounts. The coarsest materials are along the northern borders of the fans, and as the formation reaches south the finer materials become more and more prominent.

There are two areas east of the Susquehanna River where this conglomerate occurs, through which no major stream is flowing now. The first of these the Hosensack area lies in the southern tip of Lehigh County in Lower Milford Township, and the adjacent section of Bucks County. The second lies in the vicinity of Leithsville in Northampton County, just south of Hellertown. Contrary to published maps, these two areas are not continuous, but separated by an area of sandstone. Both these areas lie south of the only breaks in the Reading Hills between the

[4] Myers, R. E., "Structure and Possible Origin of Leibert's Gap", Proceedings Penna. Academy of Sci., Vol. XVII, 1943.

[5] McLaughlin, D. B., "A Great Alluvial Fan in the Triassic of Pennsylvania", Mich. Academy of Sci., Vol. XXIV, 1938.

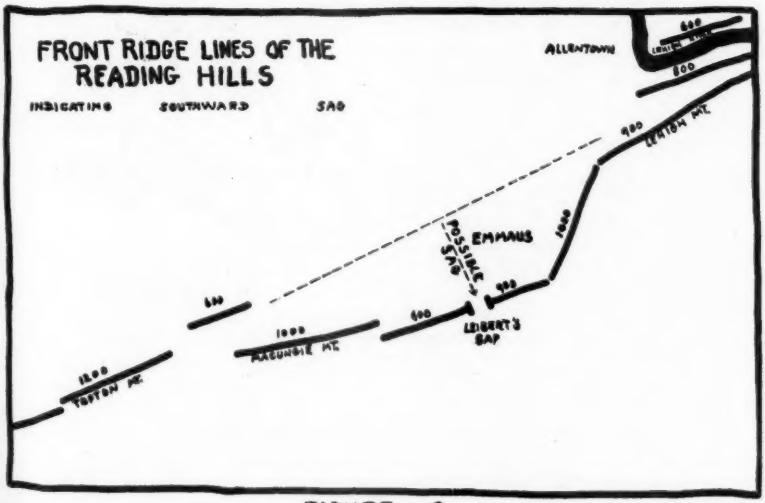


FIGURE 2

Schuylkill River and the Delaware River. These are (1) Leibert's Gap, north of the Hosensack area, and (2) the Saucon Gap, north of the Leithsville area. Both fanglomerate deposits are of considerable size, as are also the materials of which they are composed, and could only have been deposited through the agency of a large stream. The assumption can therefore be made that a large stream flowing south through each of these gaps was responsible for the deposition of these two areas of fanglomerate. I shall designate the Lehigh River as the stream which flowed south through Leibert's Gap, and suggest the name Saucon River for the stream that flowed south through the Saucon Gap. Let us examine the possible drainage picture at the time when this condition existed.

As indicated in PLATE 1, the Lehigh River flowing south from the Lehigh Gap in the Blue Mountain, crossed the Lehigh Valley with its present bend at Treichlers, but turned southwest at Allentown and crossed the Reading Hills through Leibert's Gap, to the Triassic Perkiomen Valley, and thence to the sea. Possibly the ancestor of the Jordan Creek occupied the Lehigh Furnace Gap at this time, and

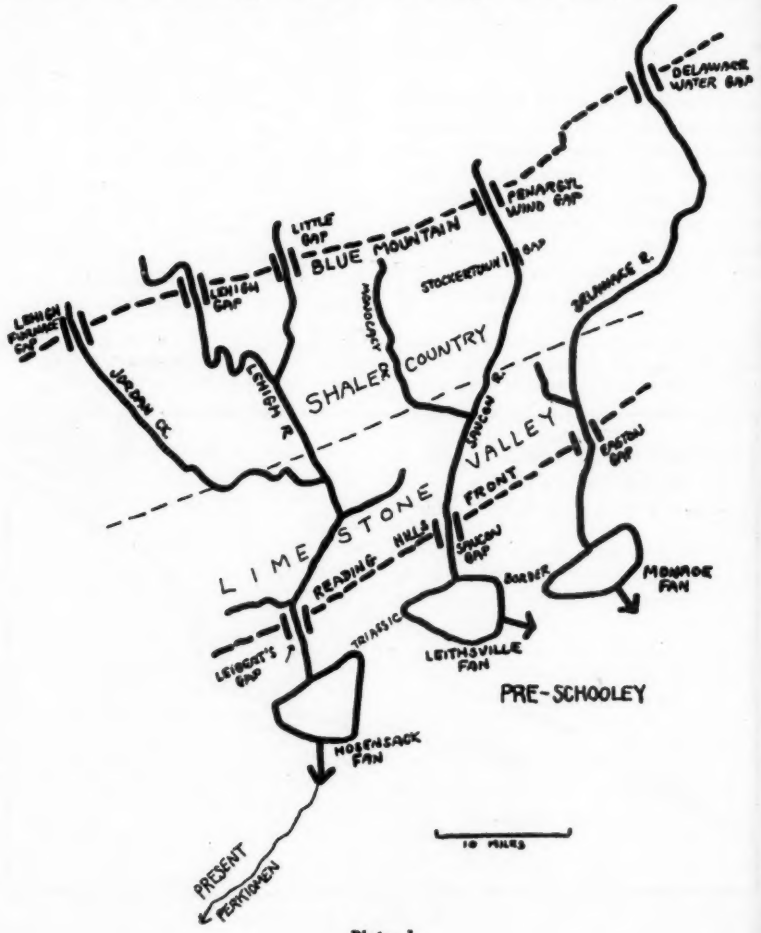


Plate 1

the Hockendauqua Creek flowed south through Little Gap, both of these gaps being in the Blue Mountain. A small westward flowing tributary joined the Lehigh at a point where that river turned southwest (Allentown) to approach Leibert's Gap. The Little Lehigh joined the Lehigh somewhere north of the Reading Hills, not far from the gap.

Flowing through the Wind Gap in the Blue Mountain, the Saucon River took a southern course through the present Stockertown Gap in the shale hills (Martinsburg) north of the limestone portion of the Lehigh Valley, and then flowed out across the limestone "drylands", past Freemansburg, through the Saucon Gap in the Reading Hills, on into the Triassic lowland in the neighborhood of Leithsville. The Monocacy was tributary to the Saucon River, joining it halfway between the Blue Mountain and the Reading Hills. There may have been small eastward and westward tributaries of the Saucon River meeting it just north of the Saucon Gap. It is certain that such tributaries did develop later.

The Delaware, following more or less its present course, we need not describe in detail, except to note that its tributary the Bushkill, existed as a small northward flowing stream, and another small tributary, flowing east along the front of the Reading Hills, joined the Delaware at Easton.

Now let us examine the changes that took place to develop the present scene. First of all, as described by Miller[6] and others, post Schooley piracy north of the Blue Mountain created the present wind gaps, leaving streams flowing only through the Lehigh and Delaware openings.

[6] Miller, B. L., Lehigh County, 1941.

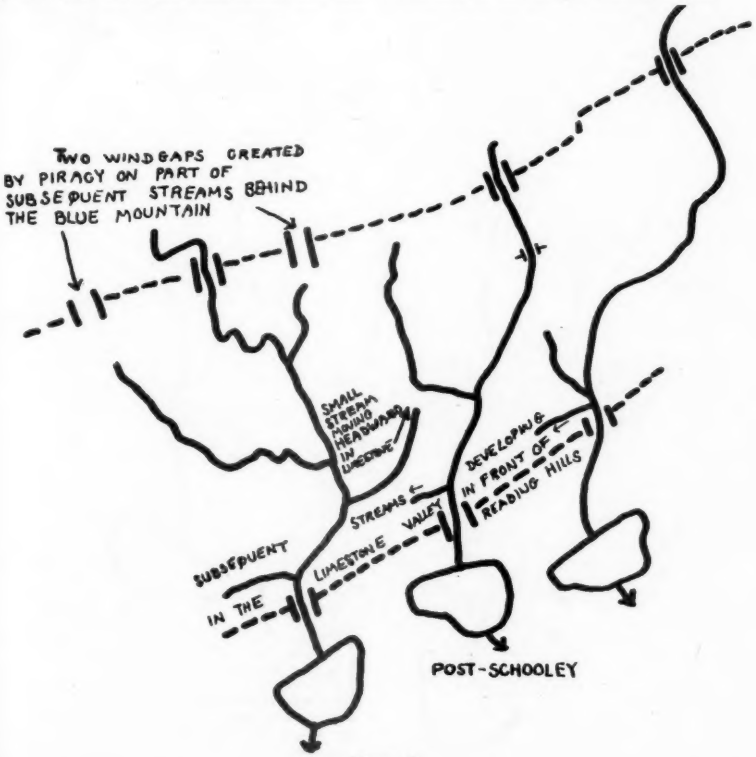


Plate 2

(PLATE 2.) Thus the Saucon River disappeared. (PLATE 3.) The Bushkill began to head into the upper drainage areas of the Saucon River below the Blue Mountain. South of that point, in the region known as the "drylands", there was inadequate volume left to carry the remnants of the Saucon River southward. The western flowing tributary of the Lehigh at Allentown, heading east captured the Monocacy near its old junction with the Saucon River. An inadequate supply of water now made it impossible for the Saucon to cut through the Leithsville fanglomerates, and a reversal of drainage took place, with the Saucon now flowing north from what is now called the Saucon Valley, out through the Saucon Gap into the Lehigh Valley. Headwater piracy by the smaller Delaware tributary in the limestone valley in front of the Reading Hills between Easton and Freemansburg, carried the Saucon drainage to the Delaware at Easton, and the remnant of the Saucon River above Freemansburg became the present Nancy Run. (PLATE 4.) This can account for the present bend in the Lehigh River at Freemansburg.

The Lehigh however, still flowing through Leibert's Gap, was captured by a westward advancing Saucon tributary in front of the Reading Hills. This advance in a limestone valley is not difficult to postulate. (PLATE 5.) The elbow of piracy was located below Rittersville Hill, near the point where the then westward flowing Monacacy joined the Lehigh.

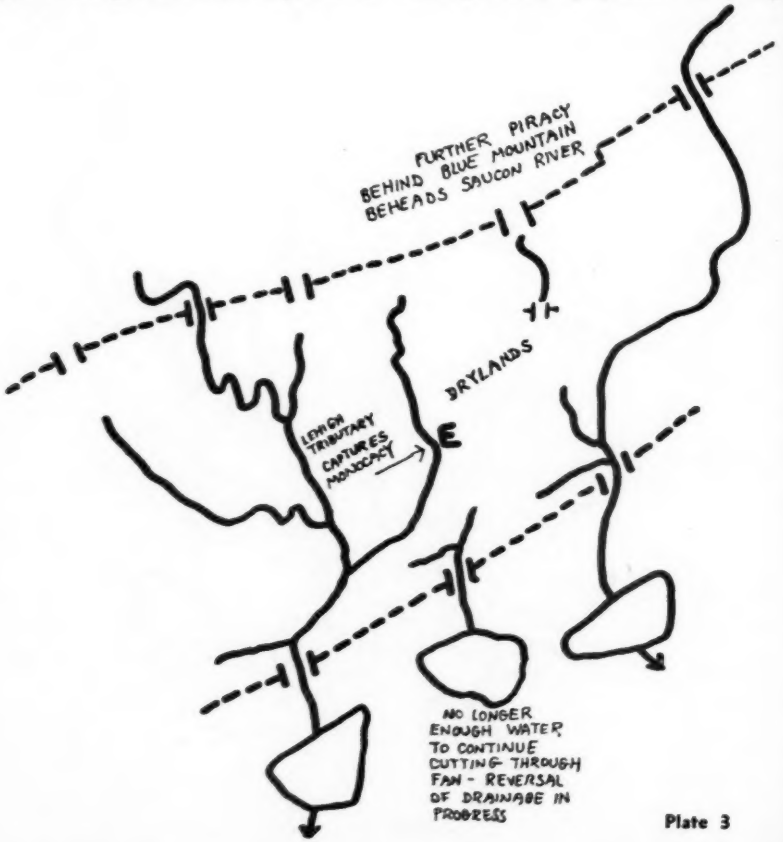


Plate 3

This can account for the big bend in the Lehigh at that place.

Glaciation brought on the last act in this drama, when the channel of the Monocacy below Irwin's Paint Mill in Bethlehem, was filled with glacial rubble, and the stream was deflected into its present lower course. (PLATE 6.)

DATING THESE EVENTS

There is a general belief that prior to the Appalachian Revolution drainage was northwest to the great interior sea. Following the Appalachian Revolution this direction was reversed. During the Triassic it was undoubtedly to the southeast. This is shown by the position of the fans in question, as well as other fans along the northwestern border of the Triassic today.

The likelihood that the upper portion of Leibert's Gap was cut at this time is borne out in part by the known age of the fans, and in part by the fragments found in them. The gneiss cobbles and pebbles strongly suggest the older Appalachians (Reading Hills) as a possible source. The limestone and sandstone fragments could have come from the Paleozoic formations that at one time covered the Reading Hills and today are exposed north of them. Any southern source for these materials appears doubtful. Moreover the structure of the fans is indicative of a northern source.

Plate 4

Following the formation of these fans in the Triassic, and the cutting of the gaps in the older Appalachian highlands to the north, came the development of the Schooley or Kittatinny Peneplain. Most writers have assigned this to the Cretaceous. Recently Ashley[7] suggested it belongs no further back than the Pliocene. Miller[8] suggests the Lehigh River as having taken its present course on this peneplain, but Ver Steeg[9] reached the conclusion that the streams of the Lehigh Valley were developed in an earlier cycle, and held their course through Schooley time. In this the writer agrees.

Regardless as to how one wishes to date the Schooley Peneplain, it is safe to date the drainage changes as described in this paper as post-Schooley. Thus to date them as Tertiary is a safe assumption, leaving the exact subdivision of the Tertiary somewhat in doubt.

Obviously the final change falls in the Pleistocene.

[7] Ashley, G., "Studies in Appalachian Mountain Sculpture", G.S.A. Bull. 46, 1935.
[8] Miller, B. L., Lehigh County, 1941.
[9] Ver Steeg, K., "Wind Gaps and Water Gaps in the Northern Appalachians", Annals of the N. Y. Aca. of Sci., Vol. 32, 1930.

TO SUMMARIZE

We have evidence at Leibert's Gap suggestive of two cycles of erosion. We have also ample indication of structural weakness at that point, which is believed by some workers to be an important factor

Plate 5

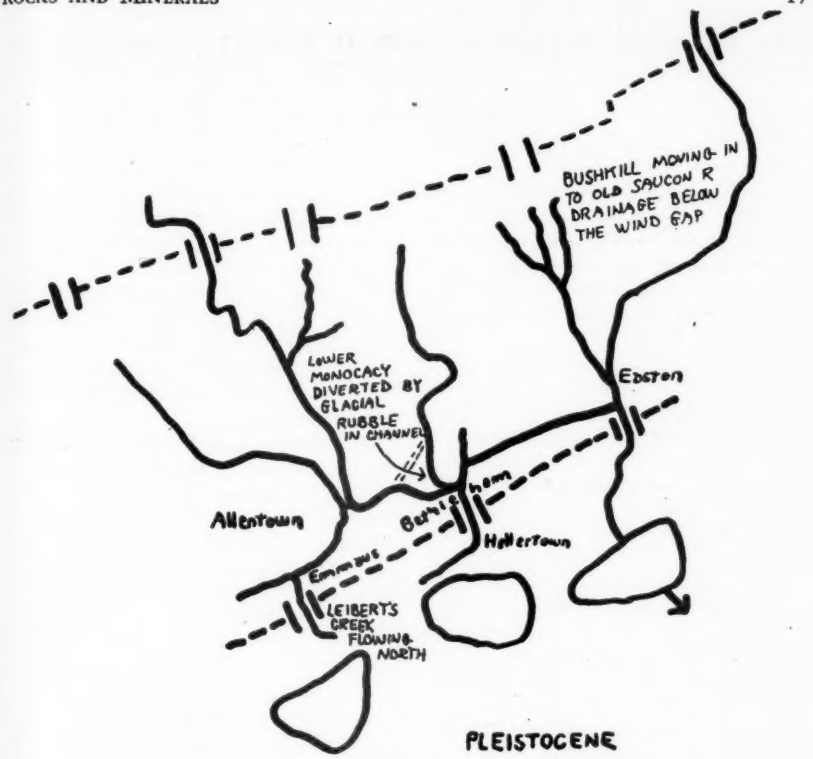


Plate 6

in the location of places where major streams cut water gaps through Appalachian structure.

South of the gap and in line with it, is the Hosensack fanglomerate of Triassic age. This is evidence to indicate the former presence of a southward flowing stream of considerable size, which must have been active in the late Triassic.

In the valley to the north of the Reading Hills we can construct the possible drainage changes that removed the southward flowing stream from Leibert's Gap, and in so doing we can account for the Saucon Gap several miles to the east, as well as the present course of the Lehigh River.

Robinson Edits "The Puget-Sounder"

Mr. C. H. Robinson, Sr., of 623½ 16th St., S. W., Puyallup, Wash., is the first editor of Tacoma Agate Club's new publication, *The Puget-Sounder,* which will come out monthly. The first issue came out Dec. 1, 1948. It is 5½ x 8½ inches in size and contains 6 pages. A feature article in this issue is an interesting item, "Prospecting gem areas," by A. A. Porter.

Not only is Mr. Robinson honored in being appointed editor but he has the distinction also of coining the name of the paper, *The Puget-Sounder.* He had suggested that the selection of a name for the paper be put up to the Club members —and President Nels Olsen had even offered a $5.00 trade prize from The Tacoma Lapidary Supply Company for the winner. Mr. Robinson was most agreeably surprised when the Club members, almost unanimously, voted in favor of *The Puget-Sounder.*

THE FAMOUS PETRIFIED WOOD RUSSELL FORESTS OF WASHINGTON

By ERNEST S. BATEMAN
5108 W. Olga St. B, Seattle 6, Wash.

HISTORY

These agatized wood forests were first recognized and identified by the eminent geologist I. C. Russell, and it was only common justice that they were named after him in recognition of his invaluable services in pioneering their discovery and development.

Unlike the forests with which we are all familiar that stretch away from the highway, covering the hills and valleys, and, that are a delight to the eye, as well as being of incalculable value to man, these petrified forests that once looked the same as those of today, have nearly vanished from the face of the earth, gone underground.

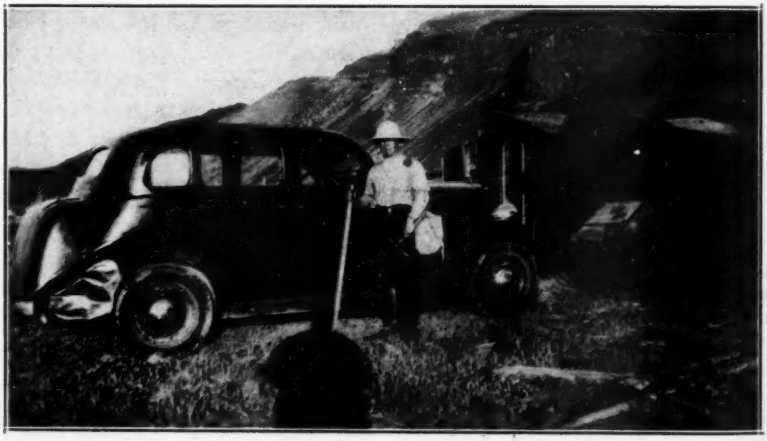
The casual traveler will look in vain as he passes by, unless he makes a personal investigation on foot, to where the decomposed basalt or rhyolite covering has been removed, either by natural forces or the hand of man.

There he will see revealed the silica replicas of trees, limbs, and roots of a bygone age estimated at 15 million years ago, reproduced with a fidelity that is indeed marvelous to behold, with colorings far more beautiful than possesed by the tree originally, with grain and cell growth delineated in perfection of microscopic detail.

The state of Washington has created a large park, naming it Ginkgo Park, after the rarest type of petrified wood found there, or that of the Ginkgo tree, rare in the United States, but common in the gardens of China.

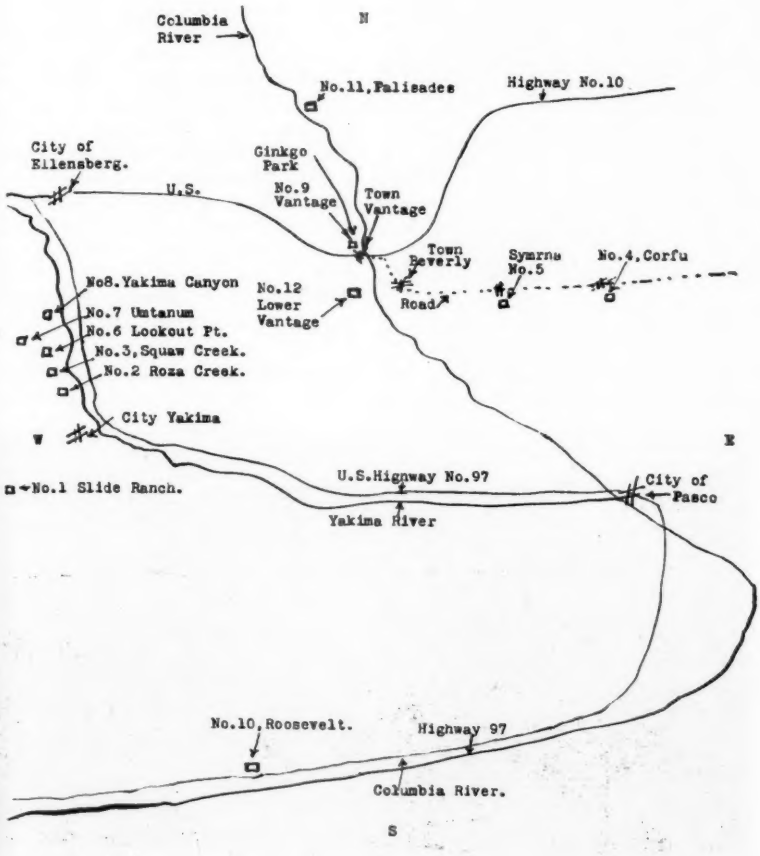
The Ginkgo Park is located within the Vantage Forest, or Russell Forest No. 9 on U. S. Highway No. 10 close by the town of Vantage where U. S. Highway crosses the Columbia River, and the perfectly preserved tree stumps and logs may be inspected at a unique museum exhibit of what are probably the most beautiful, polished specimans of the agate variety of the quartz family minerals in existance.

This group of Russell Forests is contained in an area approximately 117 miles in length and 58 miles wide, listed in the order of presumed age from the youngest or No. 1 to the oldest or No. 12.



The writer fully equipped for the days prospecting in the Saddle Mountains and Russell Forest No. 4, in the background.

Forest No. 1, or Slide Ranch, is located southwesterly from the city of Yakima. Forest No. 2, or Roza Creek, is located near the Yakima River, northwesterly from the city of Yakima. Forest No. 3, named Squaw Creek, is located north from the city of Yakima near the Yakima River. Forest No. 4, named Corfu, is located near station of that name on the Chicago Milwaukee & St. Paul Railway. Forest No. 5, named Smyrna, is located near station of the same name, same railway. Forest No. 6, named Lookout Point, is located northwest of the city of Yakima, near Yakima River. Forest No. 7, named Umptanum Creek, is located north of the city of Yakima, near Yakima River. Forest No. 8, named Yakima Canyon, is located north of the city of Yakima, near the Yakima River. Forest No. 9, named Vantage, is located near town of Vantage at Ginkgo Park. Forest No. 10, named Roosevelt, is located near town of Roosevelt, near Columbia River. Forest No. 11, named Palisades, is located east of the city of Wenatchee, near town of



Map showing location of the famous Petrified Forests in Washington.

Palisades. Forest No. 12, named Lower Vantage, is located near town of Vantage.

State Highways and fine county roads run thru or near by nearly all of the Russell Forests, which are located on privately owned land in most instances, requiring owners permission for entrance and exploration.

GEOLOGY

The geological structure of this area does not seem to present any problems that are not readily solved. The main point of disagreement amongst experts being upon the time factor, and processes of silification, coloration and crystallization. Geologists agree that on no other portion of the globe was the surface so riven and tortured by volcanic upheaval, and lava deposition, as the area of these basaltic flows which extend beyond the State of Washington, and are measured in tens of thousands of cubic miles, as well as square miles, with deposition on the surface of molten lava from the interior, thousands of feet in depth.

These basaltic flows, whose age is assigned to the Miocene, apparently occurred irrregularly with intervals giving sufficient time to permit the natural forces of erosion and deposition to produce a luxuriant vegetation, providing ideal conditions to support a teeming animal, fish and fowl population, which would all be too suddenly and completely wiped out of existance by the next eruptive period.

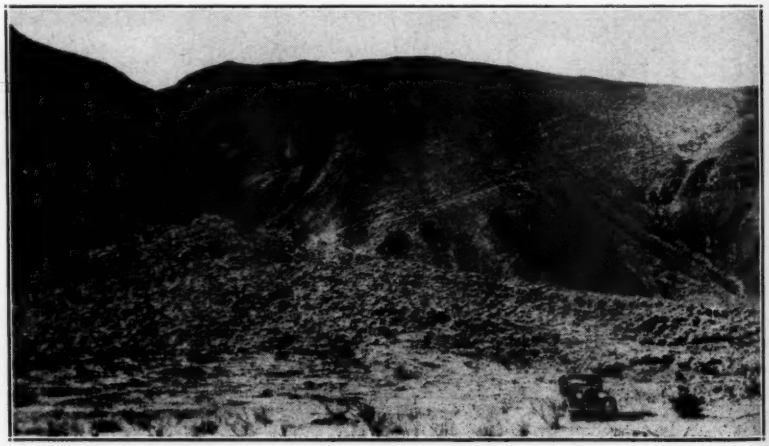
These lava flows, which spread over this great area for the most part, were not violent, but were a more or less quiet upwelling of the molton lava from vents, or conduits, now represented by dykes, which may be seen where the older formations underlying the basalt are exposed. These dykes are not so numerous as those which fed the Eocene lava flows.

The intervals or peaceful eras between eruptions, where erosion created a surface of pronounced relief, with deep valleys, and mountains averaging higher than now exist, were blotted out and obliterated by the enormous floods of molten lava which filled the deepest depressions, and lapped over the higher portions building ever higher, with each succeeding period of eruption, until eventually the regions which had been diversified with verdure covered hills and valleys as of today, became a monotonous waste of black rock, with all life completely extinguished.

The cycle continued thruout the ages, down to the last eruptive or Quaternary period, when the present topography developed with the volcanic era definitely ended.

ORIGIN OF THE RUSSELL FORESTS

The lava is frequently porous and



View of basalt cliffs of Saddle Mountains containing Russell Forest No. 4, with the "Agate Special" the writer's car, in the foreground.

phases of the basalt occur that are amygdaloidal.

Of these famous Russell Forests of Washington, an outstanding authority has said, in none of the other well known fossil forests of the world, have so many species been encountered, or are the trees entombed in what was once molten stone or lava.

Great variety of species and entombment in lava or basalt are closely interrelated.

What has been accepted as the typical petrified forest seems to have associated with coal making in the slow process of which, none but the most highly resistant trunks, roots and stems, escaped disintegration.

The Russell Forests entombment in molten lava was relatively rapid, the whole aggregation of trees and logs, whether growing in low swamps, or inundated bottom land, or piled up in river rafts, having been encased within a single onrush of fiery molten lava.

There seems to have been practically no elimination of trees awaiting burial, provided that there was sufficient water present to protect them from being consumed forthwith.

This circumstance is attested by the presence of pillow lava, or structure, (formed by contact of lava and water) acting as an effective fire resistant, or buffer, in the zones where petrified logs occur.

This process of entombment was repeated over and over, as molten lava forming the great series or cycles of Columbia (Yakima) basalts welled up thru local fissures, and spread laterally many miles in every direction.

Thruout a period of thousands, if not millions of years, these great lava flows piled up to a depth of thousands of feet, periodically destroying all living things, but, leaving the drowned trees and forests behind as a partial record of the life of those perilous times. This is believed to have happened some 15 million years ago, in the Upper Miocene epoch, when the forests of the Northern Hemisphere had not yet suffered the final and extreme decimation of the Ice Age.

In some places these Central Washington petrified forests are quite restricted in size and number of species.

This is true of the rooted stump areas representing but a single habitat.

Other horizons like the main Vantage Forest, covering tens of square miles, are composite in character, having derived their unrooted logs, i.e.; (logs stripped of limbs and bark) from the contrasting

The writer's wife and youngest daughter resting on a huge basalt boulder, during the difficult climb to the embedded petrified (agatized) trees in Russell Forest No. 4.

habitats and life zones of the drainage system of some ancient master stream. At a most conservative estimate, the petrified forests of Vantage, including Ginkgo State Park, contain over 50 genera of trees. However, many of these are represented by only one or a few specimans, so that about 15 generic types account for 90 percent of the stems.

Amongst the species identified, are fir, sandovac, ginkgo, spruce, douglas fir, pine, redwood, swamp cypress, yew, maple, buckeye, alder, birch, hickory, persimmon, beech, ash, honey locust, swamp bay, witch hazel, black walnut, red gum, mountain ash, tupelo gum, sycamore, cottonwood, cherry, Chinese walnut, oak, soapberry, locust and elm.

It is safe to predict that well preserved and present in unlimited quantities, both as to species and individual logs, the Russell Forests will become the standard of reference for fossil wood studies of the western Tertiary Period.

SILIFICATION

The theory of silification by replacement, may be briefly stated by summarising the opinions of many competent and logical thinkers on the deposition of silica in petrified trees, as we find them today.

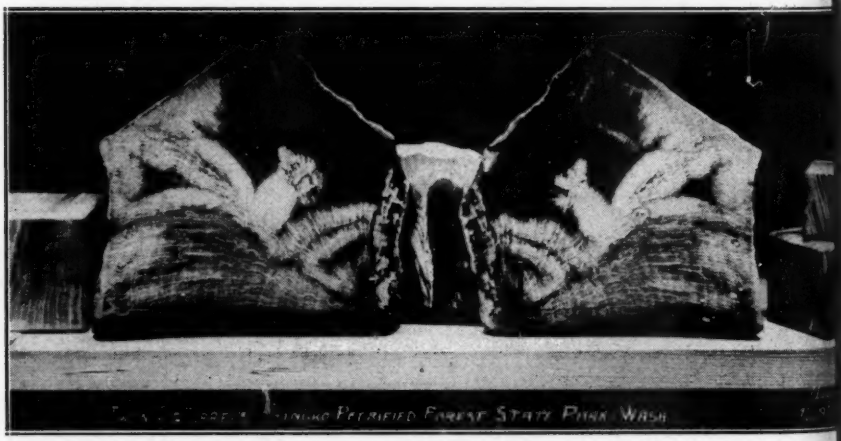
The theory of the replacement of wood fibers and cells by the magmatic waters circulating upwards, heated to temperatures approximating that of molten metal, carring silica, iron, copper and manganese in solution, all under pressures great beyond belief, appears to the writer to be entirely reasonable and probable.

The actual dissolution of the wood material under such conditions of enormous heat and pressure is certain, and the practically simultaneous replacement by minerals present in solution thru capillary diffusion, probable.

The deposition of the minerals followed so closely upon the destruction of the wood material, as to faithfully reproduce the wood structure in the most minute detail.

Because of the presence of a small percentage of the wood materials in the centers of logs, where replacement by silification is arrested or incomplete, doubts exist in the minds of well informed experts, who put forth the theory that the wood structure is not entirely destroyed from the log, but remains in the form of skeleton framework, encased by the minerals and plainly showing its original form, etc. after removal of the minerals by dissolving.

This last condition may be true in general in some districts in other States, applying to all or a high percentage of the petrified wood there, but the writer does not believe the condition applies to the



Showing two companion slices of agatized wood, species cypress, with reproductions of squirrels as they looked 15 million years ago.

Russell Forests of Washington in more than the small percentage stated.

It would be as reasonable to assume that all petrified wood, everywhere, was produced under the theory of formation by casts. This the writer believes untenable.

COLORATION

Up to the present writing, the research on this most fascinating phase of the genesis of Russell Forests petrified wood apparently has made but slight progress.

As to why, and how, mineral solutions associated with silica should take the forms, and color combinations in such infinite and gorgeously beautiful forms, with such harmonious blendings, is a subject to test the ability of our top scientific investigators.

Continued research, both amateur and professional should in time shed light on the subject.

COMMENT

The writer believes that no other known area containing petrified wood, presents an equal opportunity to examine, study and collect, such an unrivalled variety and number of separate species, as those present in these famous Russell Forests of Washington.

As is usually the case, vandalism has caused many owners of the properties where these Forests lie, to post no-trespassing notices. But a personal application for admission will in nearly all cases secure admission for study and collecting especially if accompanied by a membership card in an Earth Science organization, or letter from an institution having a department of geology.

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The Mineralogist Magazine, April 1935.

Gingko Petrified Forest State Park of Washington, by Chas. Simpson. *Rocks and Minerals,* Sept. 1945, p. 425.

Variscite Incident Recalled

By Fred Dustin

709 S. Fayette St., Saginaw, Mich.

In the November-December number of ROCKS AND MINERALS, page 932, an interesting paper, "Rediscovery of a Variscite Deposit" appears, and as the writer noted the name of the discoverer, "Dan Malone," there seemed something familiar about both name and account, and a correspondence which began early in 1930 with "*DON MAGUIRE,* 549-25th St., Ogden, Utah," was recalled. This correspondence was concerning various gems, and the writer had sent Mr. Maguire certain gems from Isle Royale, such as chlorastrolite and thomsonite. In return, Mr. Maguire had sent magnificent specimens of variscite of unusual type, to which he had given the name of *chlorutahlite.* He had a most interesting history, and as I recall it, carried an Indian arrowpoint in some part of his person, received in an Indian fight. His writing was very difficult to read, and I had to slowly "translate" it, but so much time has elapsed that at present, being too busy, cannot speak too definitely. He showed a high grade of intelligence and had much experience. Our correspondence almost entirely concerned gem material. Letters were exchanged for about a year, and it appears that "Dan Malone" was none other than Don Maguire.

In two or three volumes of the U. S. Geological Survey's annuals, "Mineral Resources of the United States," Mr. Maguire's reports will be found. Following is a passage from one of his letters.

"Chlorutahlite is a very unique gem—which I mined for fifteen years. The mine now produces very little or none. I have not worked it now for ten years. It is situated in Chapultepec Canyon, Utah County, Utah. The stone is found there only: its color green of varying shades."

The writer has carefully preserved Mr. Maguire's letters, and perhaps may later on, find time to make a transcript of the most interesting parts.

A GEOLOGICAL ODYSSEY THRU THE PROVINCE OF ONTARIO, CANADA

By JOEL HALPERN
90 Central Parkway, Mt. Vernon, N. Y.

During the month of June my suppressed symptoms of spring fever erupted and I was left with a desire to travel north. This led me on a strange and fascinating journey through northern Ontario. I inveigled my friend John to accompany me. I told him he would never regret such an enlightening tour, I don't think he ever will. We made our little expedition extremely interesting from a geological standpoint. Unfortunately in many instances our explorations were limited by our peculiar means of travel (hitch-hiking). In spite of this we were able to do most of the things that we originally planned. In the course of our travels we collected fossils, minerals and some interesting anecdotes about the romance of mining.

I met John in Toronto. There we made some inquiries about certain fossil localities from the Museum of the University of Toronto and then I went over to the Bureau of Mines to get some more detailed information and some maps of various mineral localities. After making the usual inquiries about Cobalt, Sudbury and the northern gold fields, I casually inquired about Coral Rapids. (Coral Rapids is a tiny railroad station on the Moosonee line of the Northern Ontario Railway about 90 miles south of James Bay, the southern extension of Hudson Bay; some interesting fossil corals and plants of about Devonian Age have been found there). Hadn't I heard there had been a big Uranium strike up there and the news had been on the front pages of all the Toronto papers? Well this to put it mildly increased my enthusiasm for the trip immensely. So after getting a word or two of advice (e.g. take plenty of fly dope and mosquito netting) and purchasing some supplies, we left Toronto by truck for North Bay.

We arrived in North Bay 238 miles north of Toronto the following morning. From there we secured transportation to the town of Cobalt once one of the silver mining centers of the world. Today it is a village of two thousand people. The landscape is dotted with huge piles of waste rock, rusty mine shafts and rusty tin shanties. Despite the fact that an article appeared in one of the leading New York newspapers saying that Cobalt is undergoing a revival due to the fact that some of the waste rock contained Uranium; I found no sign of such increased activity. After speaking to some of the geologists who did survey the piles with Geiger Counters, they told me that it was just a routine check and nothing of unusual interest had been found.

Silver-Miller Mine

One of the few silver mines still operating in this area is the Silver-Miller Mine which is largely owned by American interests and since I was an American tourist I was treated very kindly by Mr. Miller. The mine is located about three miles from town near the edge of a small lake in a densely wooded area. The mine employs about 25 men and there is one shaft about 500 feet deep. The mine itself is part of an old claim that was given up and then reopened by Mr. Miller, an old time prospector, who was sure that he would strike pay dirt. After drilling under the lake they struck a rich vein and have been producing high quality silver ore ever since. One of the engineers showed me around the property. There is one wooden shaft house. Nearby there are two piles of rock. One of these is an ore pile the other waste. A short distance away there is a two story wooden building that serves as the office. I was a little surprised to see all the different forms in which native silver is found. I saw samples of silver in the form of wires growing out of rock, in the regular massive form, imbedded in calcite, and in thin sheets found between layers of rock. In the mine office there were several pieces of solid native silver weighing as much as 50 pounds each. Most of the silver occurs at the junction between the

Nipshemning diabase and the basalt rock, these junctions occur at two levels and it is from there that most of the output of the mine comes.

Later during my visit I was fortunate enough to be able to go underground. After being equipped with a metal hat, acetylene lamp, rubber coat and boots I descended the shaft. The silver occurs in thin calcite veins sometimes native but more often thinly disseminated throughout the rock or with cobaltite or smaltite. The metal is mined by stoping, that is, they drill up and then blast down and carry the ore away in cars.

Thru the kindness of the mine manager, I was allowed to explore the mine and ore piles. I was able to secure some rather good specimens of leaf silver, massive silver, hollandite, stephanite, cobaltite, smaltite, niccolite and several other minerals.

Collecting Fossils at Wabi

From Cobalt we went north to New Lisekard a distance of ten or twelve miles. There we went out to the tip of Wabi or Dawson's Point, a short piece of land protruding into Lake Timiskaming. Under the crumbling limestone cliffs, we collected fossil corals chiefly of the Silurian Age. These cliffs are very interesting for they consist partly of the so-called lithographic limestone an extremely smooth stone used for lithography. I sent my collection back to the University which I attend so that it may be possible to check on the extent of the Inland Sea which once existed there during Geologic Time (probably Silurian time).

Coral Rapids, Ontario

We now continued north thru Englehart, Winston (Swastika), and Cochrane. From Cochrane we travelled north to Coral Rapids by train. It was our only alternative since there are no roads north of Cochrane. The train was quite an experience in itself. It runs north only on Tuesday and Thursday and south on Wednesday and Friday. There is no schedule and the time you arrive at your destination depends entirely on the good will of the train crew. The people going up on the train were mostly Indians and trappers. However we did meet one "happy" prospector who offered to fly us to the Yukon where we could easily make our fortune in a Uranium find. Nevertheless he did give us some helpful hints on identifying native gold. It can be easily distinguished from iron pyrites by its rough feel, the same is also true of native silver. About six hours later we arrived in Coral Rapids. The train stopped before a group of sheds a watertower and one house belonging to the section foremen. The whole town was out to greet us, the postmaster, an old pensioner and his wife, three section hands and the section foreman. The woods surrounding the track and the town consist largely of conifers interspersed with some birch. Away from the railroad the whole area is largely muskeg and infested with insects. Thus boots and fly dope are a necessity. At the town we met several geologists who represented some of the largest mining concerns in the Dominion. They were very courteous and invited us to their camp four miles upstream on the Abitibi River, which parallels the railroad line. (Note: All of this area is within the Arctic Watershed, i.e. all waters flow toward the Arctic Ocean.) Therefore upstream is south.

Arriving at their camp the following day, we were informed that we would be guided to the sight of the original strike and to date the only one. We were also a little disappointed to learn the truth about this Uranium find. It was so vastly different from the newspaper account. Wherever the outcrop is exposed it causes activity on the Geiger counter. On the most sensitive (2M) scale the meter will go off scale in most places in the vein, but on the intermediate (10M) scale, the readings over the vein, with the Geiger counter resting on the outcrop are about 4 to 8 times normal. Nevertheless the land has been staked by many mining concerns and individuals for miles around. Even the men on the train crew have their claims.

Uranium Strike at Coral Rapids

From the geologists' camp, the claim is only about a mile but it is on the other side of the river at the head of Otter Rapids. Crossing the river above the

rapids then following a portage for about 30 chains to the north, and then striking back toward the river, is the easiest way of reaching the vein. The site of the strike is indeed picturesque. It is located at the foot of the Rapids. The towering cliffs and the extremely turbulent water remind one of the Grand Canyon of the Yellowstone. The vein outcrops in a rocky cleft between the river and the shore. The vein itself is only about a foot wide. The radioactivity seems to be confined to a single vein of carbonate material. The carbonate is a pale grey-green color and crystalline, with a granular texture, weathering to a smooth brown surface. It is probably impure dolomite and reacts only slightly to cold dilute hydrochloric acid. The only common ore mineral noted in the carbonate vein is specularite. Pyrite is sparsely present in tiny cubes and chalcopyrite although noted is quite rare. Microscopic analysis of the vein material shows it to consist of more than 75 percent carbonate, with the remainder made up of feldspar, mica, and hematite. The feldspars are in poorly formed phenocrysts of orthoclase and albite, which shows all stages of replacement. The mica is pale-green muscovite and probably the cause of the greenish color of the vein. The U_3O_8 runs between .12 and .03 percent. The fact that radioactivity is present in the pegmatites which surround the vein suggest that further prospecting may uncover valuable deposits.

More Fossils Collected

This ended our mineral collecting in the area but our fossil collecting was just beginning. Several miles downstream at a locality called Sextant Rapids we secured some fairly good specimens of leaf imprints in a green micaceous shale one or two feet above the water level of the river. Further upstream at Coral Rapids I obtained some nice Paleozoic invertebrates at the base of some overhanging limestone sliffs.

Sylvanite Gold Mine

On our way home we stopped at Kirkland Lake and were fortunate enough to be able to visit the Sylvanite Gold mine. The gold found in this camp is mostly in the combined state and is finely disseminated throughout the rock. The ore runs between twelve and fourteen dollars a ton. Compared to the silver mine I had previously seen, the gold mine really represented mass production. There were several hundred men working there. The property included a huge crushing mill and a large refining plant. The main shaft goes down more than 4,000 feet. The ore occurs in large veins sometimes as much as twelve feet across.

After being blasted out the ore is brought to the surface where it is finely crushed and then ground into a well divided powder. This powder is then treated with sodium cyanide solution in order to dissolve the gold and silver. The tailings or waste rock is then filtered off by means of huge rotary drums and discarded. In fact the original Kirkland Lake has been completely filled up with tailings. The solution containing gold and silver is then passed thru finely divided zinc and the gold and silver are precipitated as a black sludge. From this the metals are easily extracted.

When I came back to the mine office after going underground I was shown several samples of native gold and was fortunate enough to secure a specimen containing native gold and sylvanite, a gold-silver telluride for which the mine is named.

Acknowledgment

I am indebted to Mr. Nelson Hogg, Provincial Geologist, Timmins, Ont., for some of the information on the Uranium strike at Coral Rapids. Recent correspondence shows that the radioactivity is due mainly to thorium.

Jersey Rock-Hounds (Teen-Agers) Attention!
Editor R. & M.:

I would like very much to get together with some rock-hounds my own age (18yrs.). I am interested in lapidary work and have been collecting minerals for about three years. The collectors I wish td meet should live around this district so we can arrange some field work for 1949.

I will be very much indebted to you for any assistance that you can extend to me.

Harry Tammen
3 Eldorado Pl.,
Weehawken, N. J.

Nov. 9, 1948

THE BRIDGEWATER COPPER MINE FROM THE COLLECTOR'S STANDPOINT

By W. H. HAYES
35—22nd Street, Irvington 11, N. J.

This copper mine, one of the oldest in the country, was known as the Bridgewater mine for many years, and was worked by different companies at different periods and finally came to be known as the American mine. The original name probably came about because the mine was located in Bridgewater township, Somerset Co., N. J.

As early as 1754 nuggets of metallic copper were found loose in the ground in the vicinity of the mine, one in particular being of 96 lbs. in weight. This occurrence probably led to the prospecting that was done to locate the source of this native copper. Final discontinuance of mining took place in 1910 when the tunnel entrance was filled up, and now the remains of former buildings and a steel-jacketed smelter are all that are left for observation.

The mine is situated on the lower southwest slope of First Watchung mountain, about three miles north of Somerville, and from N. J. route 29. Foothill Road now leads along the base of the mountain for a couple of miles, then the road which goes to the right up the slope to cross the mountain takes a left turn, at which point there is an old dirt road, formerly the mine road, branching abruptly to the left, and this road will bring one to the first ruins of the old buildings, which are concrete foundations. The mine dump is about 100 yards farther on.

One main dump is the source of the minerals that collectors are interested in, and to get them it requires work and digging below the surface, for the searchings of the past years have just about cleaned out the good specimens from the surface. All of the mineral specimens are in the dump, and the copper minerals particularly are much weathered, while the shales and basalt rock which were the surrounding rocks of the ore veins are not subject to so much of the oxidation process.

A collector will, by searching, dig up several attractive varieties of copper minerals: the most distinctive being a bisilicate of copper which is a dull rather than a brilliant green massive material that is compact in texture and hard enough to take a nice polish, and hydrocuprite of a deep orange color closely intermixed with massive cuprite of an uncertain purple color.

Besides the above there are thin flakes of native copper that have formed in cracks and veins of the matrix rock, very much pitted through corrosion by weather elements, but pure copper nevertheless. Chrysocolla is plentiful, and comes in many shades of green and blue-green. Now and then small pieces may be found which if cut and polished will very closely resemble turquoise in appearance. Also some of the small chrysocolla veinlets are of a beautiful translucent blue color. So far as is now known none of these are of sufficient thickness to cut into gems, but the quality is high enough to produce very nice articles.

When a chunk of material is procured containing all the above species, as well as chalcocite, and now and then a spot which appears like tenorite, is cut and polished it makes an attractive display specimen for the cabinet, as well as an interesting study piece.

A small proportion of silver has been reported from this mine, but it can only be determined by analysis. Red jasper of a rather poor texture is common, calcite in small fissures is very common, and a little quartz is mingled with the basaltic rock.

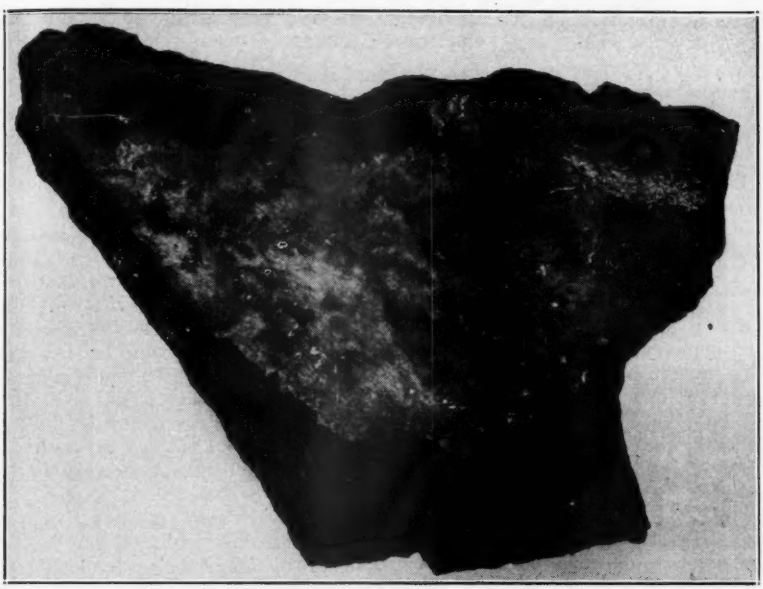
At the base of the old smelter may be gathered red slag of various shades which seem to be the silica remains or residue from the furnace. It, too, will polish nicely.

One quite remarkable specimen found during 1946 is an "eye" in a block of basalt, circular in shape, about the dia-

meter of a half-dollar, in which, on one side of the "eye", taking up about one-third of its area, the mineral is clear quartz: the center portion, which occupies more than half of the remaining area is light brown jasper, while on the opposite side from the quartz is a dike-like section of gray agate that projects into the jasper. Another somewhat rare mineral from this same dump found also in 1946 is atacamite, this specimen having only a few characteristic bright green striated crystals.

On May 30th, 1947, while collecting at the mine dump, the writer found, upon cracking a chunk of basalt that in a thin vein containing some calcite there was a very nice formation of dendritic pure copper, two inches long, and afterward, on a later visit, I found another pure copper dendrite formed directly on the basalt which is three inches long. These are quite rare occurrences and have not been reported from New Jersey as far as I know. Later in the year, in September, I had the good fortune to find here what seems to be a unique specimen, namely, chalcocite, of dendritic form, similar to the copper noted above. This has a blue-gray color and is two inches long. It is implanted on calcite, and the calcite is de-

Dendritic Native Copper implanted on basalt. Bridgewater Copper mine.
(Photo by Paul G. Kellinghausen)



Chalcocite implanted on calcite on Triassic red sandstone, Bridgewater Copper Mine.
(Photo by Paul G. Kellinghausen)

posited on the Triassic red shale that is the contact rock of the basaltic ore-bearing veins. A few small copper crystals have been found associated with calcite, also several small crystals of chalcocite showing their crystal angles very well. Last year, 1948, a new variety showed up and this is cuprite and hydrocuprite altering to copper.

The variety of colorful minerals that can be dug up at this old mine dump in a day's trip are worth the time and effort involved.

Young Girl Compliments Editor!

Editor R. & M.:

I am sending you a compliment on the book you wrote titled, "How to Collect Minerals." This book has helped me a great deal and has given me courage. I think that anyone who reads it and likes to collect minerals will be greatly pleased with it. I know I was when I read it. In one place it was especially interesting. It was where the Bear Mountain Bridge Road was being constructed and a rumor arose that gold had been struck; later the "gold" was found to be just mica colored with iron rust. There are other very interesting items in the book. I don't want to talk you deaf, dumb, and blind but when you get talking about minerals you just can't stop.

I am 12 years old and I like minerals very much. I belong to a mineral club whose adviser is my mother. The boys have a mineral club too and their adviser is Mrs. Trott,

Lots of luck in mineral hunting.

Miss Patty Harrington
Adams St., Gardiner, Me.

Nov. 11, 1948

OBSIDIAN ARTS OF ANCIENT AMERICA

By JOHN L. CROSS

1730 So. 17th East, Salt Lake City 5, Utah

In the boiling, seething cauldron of mineral creation in the area known as the lithosphere, about forty miles beneath the Earth's surface and at a temperature of about 2000° F; there has at times been complex mixtures of silicates in white hot concoctions waiting an opportunity to be disgorged by some fiery volcano upon the Earth's surface. Once upon the surface these masses are suddenly cooled by a conquering force of cold air. This cooled mixture of silicates of aluminum, iron, magnesium, sodium, calcium, potassium, and other elements, becomes known to artisans and students of rocks and minerals as obsidian. This stone was named after Obsius who, according to Pliny the Elder, discovered the stone in Ethiopia. Pliny's record (Natural History — 77 A.D.) refers to the stone as Obsian. The letters "di" have crept into the word somewhere along the line of translating or recording. Obsian has also been misidentified through history with such stones as marble, basalt, black onyx, black flint, black agate, etc., and as chalcedonies.

There was no mistaking the identity of obsidian among the Aztecs of Ancient Mexico who called the stone "Itztli". So important was obsidian to these people that they organized a mysterious and dreadful cult presided over by a goddess called "Itzpapalotl" (the obsidian knife-butterfly). Itzpapalotl is described in drawing by the compiler of the Codex Telleriano-Remensis to be a character bedecked with feathers and very elaborately dressed after the manner of the Aztec deities, with clawed hands and feet. Awesome indeed was the goddess of "The stone of the sacrificial knives". These knives were used in the sacrifice of humans to appease the ancient gods of Mexico. Some of these gorgeously-hafted knives have been brought to light from the depths of the "Sacred Well" of Chitchen Itza.

There is little doubt that the Aztecs knew and used obsidian prior to Pliny's report in 77 A.D., and other primitive and pre-historic peoples made use of the stones as proven by the discoveries of science and amateur investigators. Primitive man's knowledge of the flaking properties of obsidian extended from New Caledonia to the New World. From nearly every country on Earth relics of obsidian have been collected. These relics include such items as knives, arrowheads, spear and lance heads, swords, jewelry of various types, mirrors, and as recently discovered in Utah, coins.

Black obsidian seems to have been the most desirous for practical use while such variations and combinations as red and black, yellow and black, speckled and banded with such plain variations as black, iridescent, amber, transparent, tan and yellow found their place in ceremonial and other special uses. Obsidian bearing cristobalite nodules and flakes (flowering or snowflake obsidian) were less desirous for tools. However, modern collecters gather them for interest and the flowering variety is in demand as cutting material.

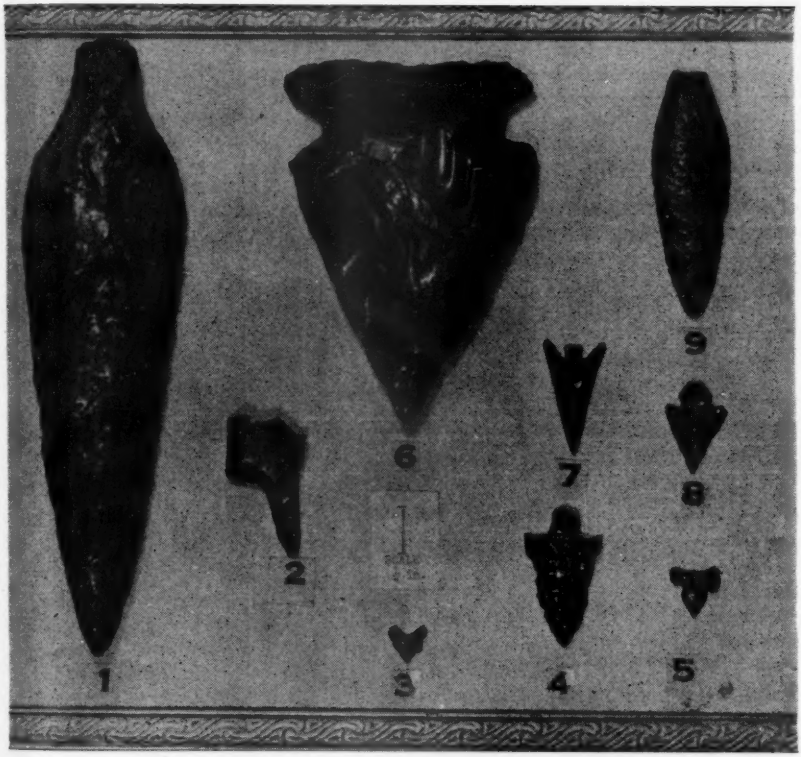
Fascinating is the study of flaking and chipping methods used by early man and interesting is the exploding of the myth of chipping by heating the stone and dropping cold water upon it. The author has studied for several years the methods employed by the primitives and has, as yet, found no proof of this procedure. When obsidian or glass masses are heated and cold water is dropped upon them they shatter. They do not flake as a rule.

The ceremonial sword blade now on exhibit in the Southwest Museum of Los Angeles, California, is thirty-three inches in length and was cut from a single slab of obsidian. This feat could never been completed with such beauty and exactness, by the Indians of Northern California, if subjected to the varying heats of the stone chippers fire. Certainly it would have shattered before it could have been completed.

There may have been a procedure of this nature in the distant past that has become, as have many primitive abilities, a lost art, but there is so much difference between the shattered particles and the graceful symmetry of chipped artifacts we may be safe to disregard such a method completely.

Torquemanda (Monarquia Indiana, Seville 1615) tells us, and is confirmed by Hernandez, the interesting manner by which the Aztecs obtained a complete knife from obsidian by a single blow. Torquemanda's report is very interesting and bears repeating in this study.

"They had, and still have, workman who make knives of certain black stone or flint (obsidian), in this manner; one



OBSIDIAN RELICS

No. 1 LANCE HEAD—Montana. Red obsidian with black streaks.
NO. 2 DRILL or REAMER—West shore of Great Salt Lake. Black obsidian.
No. 3 BIRD POINT—Ephraim, Utah. Red and black obsidian.
No. 4 ARROW POINT—by modern artisan. Red and black obsidian.
No. 5 BIRD POINT—West shore of Great Salt Lake. Black obsidian.
No. 6 SPEAR HEAD—Oregon. Black obsidian.
No. 7 ARROW HEAD—Idaho. Banded black and transparent obsidian.
No. 8 BIRD POINT—West shore of Great Salt Lake. Black obsidian. Completed by 6 flakings. Other side one fracture.
No. 9 KNIFE BLADE—Garfield, Utah. Black obsidian.

Photography by L. A. Hinckley.

CEREMONIAL SWORD BLADE

Made of obsidian, this blade is 33 inches in length and was made by the Karok Indians of California. The blade is now in the Southwestern Museum at Los Angeles.

Photograph and permission for publishing by the Southwestern Museum

of these Indian workman sits down upon the ground, and takes a piece of this black stone which is like jet, and as hard as flint. The piece they take is about 8 inches long, or rather more, and as thick as one's leg, or rather less, and cylindrical; they have a stick as large as a shaft of a lance, and three cubits or rather more in length, and at the end of it they fasten firmly another piece of wood, eight inches long, to give it more weight to this part; then pressing their naked feet together, they hold the stone as with a pair of pincers, or the vice of a carpenter's bench. They take the stick (which is cut off smooth at the end) with both hands, and set it well home against the edge of the front of the stone, which also is cut smooth in that part; and then they press it against their breast, and with a force of pressure there flies off a knife, with its point and edge on one side, as neatly as if one were to make them of a turnip with a sharp knife, or of iron in the fire." *

Another interesting method used by some of the North American Indians and the Eskimo especially, was the use of a spoon-shaped cavity in a log. By placing a flake or spall over the cavity and then gently pressing along the margin vertically, alternating sides much after the manner of setting the teeth in a saw; the alternate splintering, after properly outlining the object, presents a spear point or arrow point with two cutting and serrated edges.

The most common method was the use of the hammer stone in obtaining a spall or flake. The angle of striking determined the size, general shape and thickness of the spall. To finish the piece, flaking tools of bone or antler were ground to proper size and shape by the use of abrasive stone, usually sandstone. By directing the pressure of the flaking tool first downward and at a right angle to the edge of the spall, the general shape is brought out. To level and sharpen the edges, the tool is held in a perpendicular position to the edge and the pressure is directed downward. Smaller tools and skilful application of pressure resulted in fine edgings, barbs, and tips.

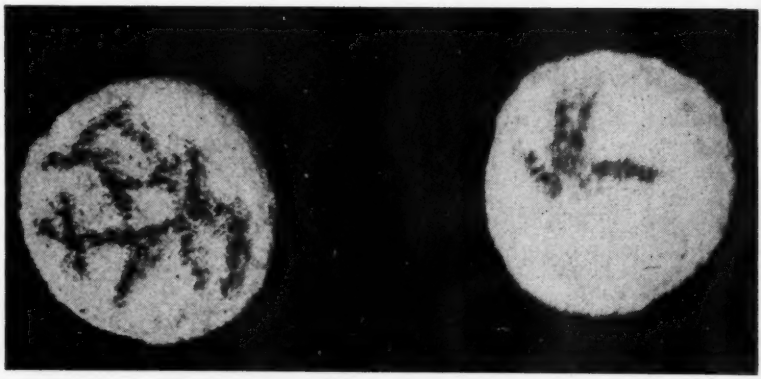
Boy Scouts are following this method in a new and fascinating hobby that brings youth in direct contact with rocks and with American Cultural history. Many individuals are becoming expert in working stone in this method and collectors of artifacts should learn to distinguish ancient relics from modern work.

The stone work presented in the coins mentioned previously shows possibilities of another method of working or artificially producing of obsidian by pre-historic Americans.

In the summer of 1941, William Langton of Salt Lake City, Utah, found in Johnson's Canyon (located about 21 miles East and North of Kanab, Utah, off state highway 136) over a hundred pieces of stone of curious workmanship. These pieces were found beneath a shale slab at the base of a huge monolithic stone in the heart of Utah's ancient or prehistoric Indian country. Examination showed that the coins fell into three sizes. One about 18 mm. in diameter, one about 21 mm. in diameter, and one about 23 mm. in diameter. The width averaged 7 mm. Experts identify the stone from which the coin is made as obsidian. The appearance is that of a buff colored sandstone, a diamond saw is necessary to cut through the coins.

Who were the artisans who produced such pieces and from where did they come, How were these artists able to conform to the same hieroglyphs on all pieces, and how were they able to maintain dimensional exactness? How did they make these pieces? These are the questions that puzzle all who see the coins. One representative of the Smithsonian Institute suggests that they are coins, stating that a similar coin, cast in bronze was found in the "Valley of the Kings" in the Nile River Region. Lorus A. Manwaring, of Salt Lake City, an enthusiast of Ancient American History to whom the author is indebted for the coin in his collection, in correspondence with A.

*Prehistoric Times: Sir John Lubbock D. Appleton & Co., Broadway, New York, 1878.



COIN OF ANCIENT AMERICA

Found in Johnson's canyon near Kanab, Utah. This relic has opened a new field of possibilities; that the ancient Americans may have had a true monetary system.

Photography by L. A. Hinckley.

Hyatt Verrill concerning these pieces, was informed of the possibility of the creation of these pieces by melting and casting the stone in a mold or crucible. Verrill did not verify their use as coins. This method may explain the conformity to size and markings and it brings to mind the experiments of Sir James Hall (geologist). From 1790 to 1798, Hall performed numerous experiments in which he proved molten masses of stone, if cooled rapidly, produced glass masses; while molten masses that cooled slowly produced crystalline masses. Such a method as suggested by Verrill may account for the unusual appearance of the coins and for its being classified as obsidian. At the time of writing, the author was notified that another group of similar coins are in the possession of some of the Indians of the Navajo Country. This group of coins may be keepsakes or treasures passed down from generation to generation or they may have been found under similar conditions to the coins of the first group. It is doubtful that they were produced by modern artisans.

With questions in our minds and visions conjured of ancient stone artisans, we wait for further word on the Ancient Obsidian Coins of America.

Micro Mounter Doing a Good Job!

Editor R. & M.:

Must confess that two months is an awful long time to wait for R. & M. but it is doubly welcome when it does arrive. The Micro Mounter seems to be doing a good job. More power to him. I am becoming a convert, have obtained an old single barreled mike, about 30 x, and am having lots of fun going over the specimens I have been preparing for several years against the time when I could get the mike.

Philip R. Cosminsky
Falls Church, Va.

Dec. 4, 1948

One Club on The Map!

Editor R. & M.:

Our Society appreciates the co-operation you have given by using material sent to your publication, as it has very noticeably put our group on the map.

D. McMillan,
Publicity Chairman
Mineralogical Society of So. Nevada
Boulder City, Nevada

Nov. 4, 1948

ALLANITE FROM GODHAAB, SOUTH GREENLAND

By A. J. BOUCOT
Harvard University, Cambridge, Mass.

During July of 1947 the writer had the opportunity, while serving as geologist on the MacMillan-Chicago Geographic Society North Greenland Expedition, to collect a suite of minerals at Godhaab in southwestern Greenland. These minerals, which came from a road cut adjacent and parallel to the harbor area on Godhaab's eastern side, include allanite, pyrite, aquamarine, molybdenite, and biotite.

The country-rock consists of a banded biotite gneiss, rich in plagioclase and quartz. The strike of the schistocity in the road cut is N35°E and the dip varies from 90° to 74°SE. Some of the gneiss consists almost entirely of dark black biotite, while other parts are a coarse feldspar of a pegmatitic appearance. In this pegmatitic material are found crystals of allanite. The gneiss is interlayered in places with an epidote-actinolite rock. In other places granite lentils, several feet in length, occur parallel to the schistocity.

Allanite occurs in black tablets with a pitchy luster, with cracks radiating from each crystal. During a period of several years, the allanite weathers to a reddish or brownish ochre, which blows away leaving no remnant of the original material. Evidence of its former existence is shown by polygonal cavities in the rock, surrounded by radiating cracks.

The fresh allanite is isotropic, with a high dispersion, and appears nearly opaque under the microscope. It is orange on thin edges. The refractive index is variable, depending largely on the amount of alteration, values ranging from 1.580-1.610 being obtained by the immersion method. The freshest material has the highest refractive index.

The specific gravity of this least-altered material as determined with the Berman microbalance is 2.875.

Semi-quantitative spectro-chemical analysis of the mineral and surrounding material was made by Dr. H. C. Harrison of the Department of Mineralogy, Harvard University. The results of these analyses were as follows:

	Ma	Min		Ma	Min
Si	A	A	Sc	X	E
Al	A	A	Ho	X	X
Fe	C	B	Dy	X	E
Mg	B-	B-	Yb	X	E
Ca	A	A-	Er	X	D-E
Na	A-B	D	Eu	X	X
K	C	E	Tb	X	E
Mn	D	C	Lu	X	X
Re	X	X	Tm	X	X
Ti	D	C-	Sm	X	X
Zr	E	D	Te	X	X
Hf	X	X	Cu	E	E
Th	X	C	Ag	E	E
Pb	E	D-	Au	X	X
Sn	X	X	Ba	C-	C-
Ge	X	X	Be	X	D
Cr	E	D	Li	E	E
Mo	X	X	Sr	D	D
W	X	D	Hg	X	X
U	X	X	Zn	X	X
V	X	D-	Cd	X	D
Cb	X	X	Ga	E	E
Ta	X	X	In	X	X
As	X	X	Tl	X	X
Sb	X	E	Co	X	X
Bi	X	E-	Ni	X	E
B	E	E	Pt	X	X
Ce	X	B-	Ir	X	X
Y	X	D	Os	X	X
Nd	X	C	Pd	X	X
La	E	C	Rh	X	X
Gd	X	X	Ru	X	X
Pr	X	E			

A 10% or more
B 1-10%
C 1-0.1%
D 0.1-0.01%
E 0.01-0.001%
X looked for; not found

X-ray powder photographs of the allanite showed only diffused bands and no measurable lines. Other powder photographs were taken of fragments that had been heated to redness, with similar results.

(Continued on page 61)

DANBURITE LOCALITY NEAR RUSSELL, N. Y.

By WALLACE CLARK
130 W. Alvord St., Springfield 8, Mass.

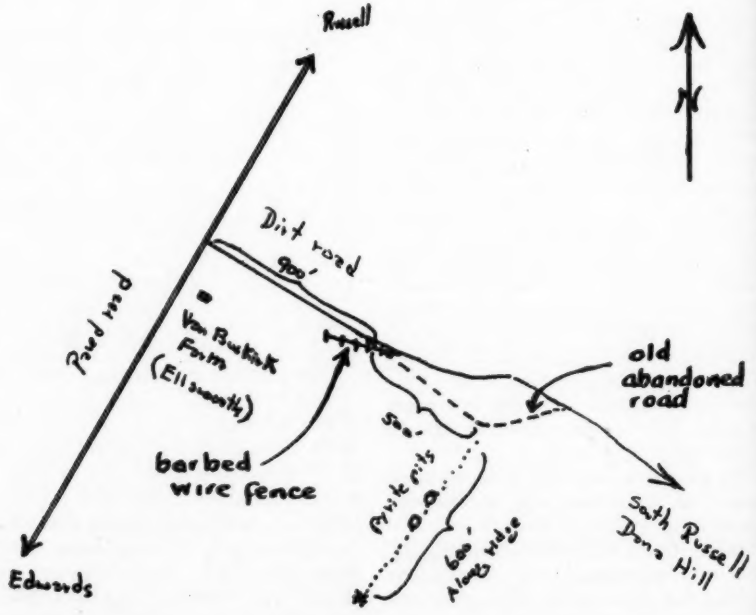
During the past two summers I have been employed by the New York State Science Service, making a magnetic survey of undeveloped iron deposits (magnetite) in the Adirondacks. Last summer I had the good fortune to work in the Russell Quadrangle for six weeks. I knew that this and the surrounding quadrangle were prolific mineral producers, but I had only the vaguest idea as to their exact location. Armed, however, with Agar's Notes and back and current issues of *Rocks and Minerals,* my buddy and I set out to find the nearest deposit of note, which was the Danburite crystals on the Van Buskirk (Ellsworth) farm.

Let me state here and now that if Agar's Notes were correct and if Mr. Slocum's "Rambles in a Mineral Collector's Paradise", were in more detail, I wouldn't be writing this, but I feel that if other mineral collectors ever try to find this locality, they will wind up in the same place I did the first two times I tried to find it.

Departing from the narrative style of writing, I shall now state facts.

Before starting out, equip yourself with a topographic map of the Russell Quadrangle. By doing this you won't have to ask anyone for directions that they probably couldn't give you anyway. Starting at South Russell, go NW for about one mile until you come to Red School, and then take the road left up the steep hill (Dana Hill). Continue along this road until you reach the NE-SW running road going to Edwards and Russell. This road junction is a good place to start from.

Pace back 900 feet towards South Rus-



Map showing location of danburite occurrence (southwest of the pyrite pits) near Russell, N. Y.

sell on the dirt road. Here you will notice the dirt road bends toward the east, but directly in front of you, beyond the barbed wire fence, and in the pasture, is the old, now overgrown road that was in use when Agar and Mr. Slocum visited the outcrop. The cattle have kept the grass close-cropped so the outline is very obvious. Another 500 feet along this old road will bring you almost to the top of a ridge and also where the road bends sharply to the left. Note that this is only 1400 feet and not a half mile as both Agar and Slocum have written. Follow along the ridge SW for 600 feet keeping on the west side of it and you should be standing in the middle of a pile of freshly broken rock. As Mr. Slocum has previously stated, it's on a line with, and beyond the pyrite pits. This is not the easiest way to get there as part of the ridge has recently been lumbered and the ground is covered with slash, but if I attempted to describe a better way, no one would ever find it. As my friends (Walden Pratt and Prof. Wright of St. Lawrence Univ.) and I have left our hammer and chisel imprints on many a rock, it will not become overgrown for many years to come.

There are still plenty of rocks on the dump containing seams and crystals of Danburite, and the exposures of bedrock reveal the same.

The pyroxene country rock, when unweathered, will not break under the impact of an Estwing prospector's pick and it would be advisable to bring a small sledge hammer along. In my many years of collecting, this is by far the toughest rock I have ever come across.

Hundreds of fair specimens can be obtained, but good and excellent specimens are as scarce as hen's teeth. Along with the Danburite are fair terminated and unterminated Diopside crystals, and perhaps a few fair Apatite crystals. We came across one about three inches long, green and unterminated.

If you were to continue along the dirt road for a full half mile and then pace 160 feet south, you would find yourself on top of another ridge running approximately E and W. This is where I originally thought the Danburite locality was, and where I found instead white terminated Diopside crystals, large masses of intergrown green pyroxene crystals of some sort, and fair to good black tourmaline crystals. Most of the latter was lying loose in the soil, but was also visible in the bedrock, which is the same kind of pyroxene rock that the Danburite is in. The tourmalines are up to 4 inches in length and many are terminated, although imperfectly.

I have only shown the Danburite locality on the map. It will do you no good to ask at the farmhouse for directions as the owner of the farm knows nothing at all except that (with a wave of his hand, toward the pasture) "there are some holes there someplace". The other localities I visited during the summer are well known and need no further description.

[1] Slocum, H. W., "Rambles in a Collector's Paradise (Part 2)", *Rocks and Minerals*, July, 1948, p. 587.

GEOLOGICAL OBSERVATIONS

How Pebbles Are Rounded

Have you ever noticed that pebbles, whether flat, ball-like, egg-shaped or in other forms, always have rounded edges How do they get round? Perhaps the following observation may explain it.

I once had occasion to wash some minerals in flowing water at the end of a large concrete culvert. During the process of washing, some ripples in the water attracted my attention and I stopped my work to investigate. The ripples were caused by small pebbles passing through the culvert. To my amazement, I noticed that each pebble, regardless of its shape or size, was rolling along the very bottom of the culvert and on into the ditch. I knew that ball-shaped pebbles would roll but it was my hazy belief that thin flat pieces would more or less "float" along or near the bottom of a stream of water. In the above observation, every thin piece rolled like a marble. It is due to rolling, which produces abrasion, that the edges of many pebbles are rounded.

Peter Zodac

VACATION PROSPECTING IN MICHIGAN

By CHARLES F. GRITZNER
Newaygo, Michigan

If you would like to find garnets, agates, thomsonites, green-stones, Petoskey stones, native copper, and over fifty other interesting minerals; if you are interested in having one of the vacation experiences of a lifetime—wholesale, here's how:

First send twenty-five cents to the State of Michigan Department of Conservation (Lansing, Mich.), for the very necessary little book *Rocks and Minerals of Michigan* and then send to the Michigan State Highway Department for a free State Highway map that will have much valuable and helpful information.

Next you should collect the necessary equipment. Sleeping bags, "pup" or larger tents will be selected according to your special needs. You won't get bunions on your hips from sleeping on the ground but your disposition might be improved by the use of an air mattress. You can pay as much as you like for comfort but the more equipment you buy the greater will be your problems of transporting, packing, and using it, and the less room you will have to put your minerals, and your feet. You will need a good mineral hammer and cold chisel and some small cloth sacks, newspapers or magazines for wrapping minerals, a note-book and numbered tape to identify the minerals as they are collected. To know where your minerals came from and to get them home in good condition will greatly increase their value. Basic foods may be purchased at home and placed in proper metal containers. For the most part you will find it to your advantage to buy your food as you need it from day to day. This is a trip you should plan for the entire family —if they are all old enough to walk. All of the Michigan State Parks have excellent recreational facilities for children. Everything will work out so that whether you pay a lot or a little you and your family will be apt to have the same result —FUN.

When your book and map arrive you will be equipped to plan your trip. No doubt you will plan to make the state and county parks your headquarters or stopping over places while in Michigan. Open your *Rocks and Minerals of Michigan* to page 46 and read carefully to page 55. Here you will find your prospectus for prospecting on your own. You can plan your trip to include iron, copper and gold mine dumps; marble, granite and diabase outcrops; there are septarian conglomerates to be found south of South Haven on the Lake Michigan shore; there are banded chert and anthraconite at Norwood, Petosky stones at Petosky. On the shores of Lake Superior you can find obsidian and pumice at Munising; agates and thomsonites on the beaches of the Keweenaw peninsula. You will enjoy the water-falls and Cambrian sandstone formations called Pictured Rocks, near Munising. There is a majestic view that will well pay you for climbing Sugar Loaf Mountain near Marquette. Near Seney you can find bog iron limonite and limonitic sandstone. South of LaAnse there is graphite. You may find "Pumpkin Seeds" by Lake Calumet and staurolite or "Fairy Crystals" at Lake Michigamme. There is beautiful banded jasper or Jaspilite at Jasper Hill in Ishpeming.

You will want to make the beautiful Van Riper County Park on the east end of Lake Michigamme your headquarters for the iron country. Here you will find excellent accomodations for the entire family. There are boats to rent and fishing is usually good here. All prices are very reasonable.

Your visit to the copper country will require the greatest portion of your time as the minerals to be found here are most abundant. There are over sixty different minerals available to the collector in this area and at least twenty of these can be found on almost any mine dump in this region.

Most every mine dump will have something new or different so don't think that by going to one you will find all the minerals desired from this area.

For real relaxation between your exciting mine dump prospectings you will

want to take in some of the famous scenic beauty of this "copper country". The majestic Brockway Mountain trip, the Highway Twenty Six drive along the shore of Lake Superior with a few stops to pick agates and thomsonites and to see the "Devil's Washtub", and a short stop-over at a bear pit are musts.

Long before you get all the minerals wanted or expected from this area time and space will challenge your will-power. There will perhaps be a wish that your car was a moving van and that you could have spent the entire summer prospecting.

If your experience will have been anything like ours was last summer this will be the possible result. Our family of five collected over one thousand specimens at ten copper, six iron, and two gold mine dumps, and three quarries, five beaches, two mountains, one hill, four road cuts and a gravel pit. We saw much of the best scenery in Michigan on our way to these places. Camping was an added pleasure in the wonderful State and County parks. It was a fifteen day trip covering 1741 miles at a cost of fifty dollars for all our transportation, food, and refreshments! We couldn't have lived any cheaper at home! Our collection of gem and other minerals is worth to us many times what was paid for the trip. All the fun we had "roughing it", the future enjoyment anticipated in going over our minerals together associating different specimens with different happy experiences of finding them will pay constant dividends. What if your minerals do appear as "junk" to others if their value to you is associated with one of the happiest and most eventful vacation experiences of your lives? To you their value will be associatied with pleasant memories.

On a prospecting vacation you will learn a lot about Michigan, its hospitality, beauty, and its minerals. You will return from such a trip richer in several ways because there are good prospects, if you aren't after gold, in prospecting in Michigan next summer and it won't take a fortune to grub-stake you.

Memorial of Thomas I. Miller

Thomas I. Miller (Captain Miller) became a member of the New York Mineralogical Club on April 24, 1900. He died in his home in Annadale, Staten Island, N. Y., May 27, 1948, at the age of 93. His wife who is blind survives him. She has been a member of this Club for many years having been elected as Miss Agnes Vinton Luther when proposed by George F. Kunz.

Thomas Iselton Miller was born in New York City March 21, 1855, the son of an English artist, William Rickarby Miller, whose water colors of New York and vicinity were recently on exhibition at the New York Historical Society.

As their Master, he commanded vessels of Mr. John Wetherell to whom he sketched a machine for the magnetic separation of crushed ore. Mr. Wetherell capitalized the idea into "The Magnetic Separator Co." and built machines that made the mining of Franklin, N. J., zinc ores first profitable in 1896, thanks to Capt. Miller.

During the first world war Captain Miller was requested by the government to take charge of ship-hull inspection in two ship building yards.

Captain Miller was interested in mineralogy, microscopy and photography. He rarely missed the field trips of the New York Mineralogical Club. Over five hundred box-mounts of minerals for microscope examination were prepared by him. The luminescence, phosphorescence and radio-activity of minerals specially interested him and he frequently demonstrated these properties to groups of his friends using apparatus designed and built by himself.

A photograph of the mineral cyrtolite and a radiograph made by the same specimen were published in the guide to the XVI International Geological Congress in 1933. Many radiographs made by him were on exhibition at the reception given to Madam Curie by the American Museum and this Club when she was in this city. Our member, O. Ivan Lee arranged this exhibit at the request of Dr. Kunz.

The Captain had been a member of the New York Microscopical Society since 1917 and up to a year or two of his death contributed to the annual exhibitions of the Staten Island Microscopical Society.

(Prepared and read at the Dec. 15, 1948, meeting of the New York Mineralogical Club by Gilman S. Stanton.)

Returns Beyond Comparison!

Editor R. & M.:

Enclosed find $3.00 for one year's renewal for *Rocks and Minerals*. It certainly is money well spent as returns are beyond comparison. I enjoy every issue and obtain so much good solid learning from them that I marvel how you can do it. All power and prosperity to you and to *Rocks and Minerals*.

Oliver A. Mason,
Dec. 2, 1948 Ogden, Utah

THE MICRO MOUNTER

Conducted by Leo N. Yedlin, 557 W. Penn St., Long Beach, N. Y.

A letter from Andy Snyder, of Randolph, Maine, together with something most unusual. But let us quote from his missive:

"Deer Hill quartz has some very good phantoms and a few inclusions, and while looking these over with the 'scope I came across some micro movable bubbles in amethyst. I immediately went to work on all the stuff I had from there, found another bubble—but on second look it wasn't there! After about 15 minutes I began to wonder if I had ever seen the thing. Then I remembered that liquids expand with heat, so I cooled the specimen under the faucet, and there it was again. I don't know at exactly what temperature it disappears, but on a hot day it isn't there." Snyder continues his letter . . . "While sawing out some pieces for facetting I noticed smoky streaks and that one streak started from some inclusions. This was in quartz from Lord Hill, Maine. I laid it aside and after a few months got around to polishing it. I wasn't surprised to find the inclusions were liquid, with movable bubbles. However, these bubbles have an added feature. At the lower temperature they stay in one place! Roughly, this is what happens:

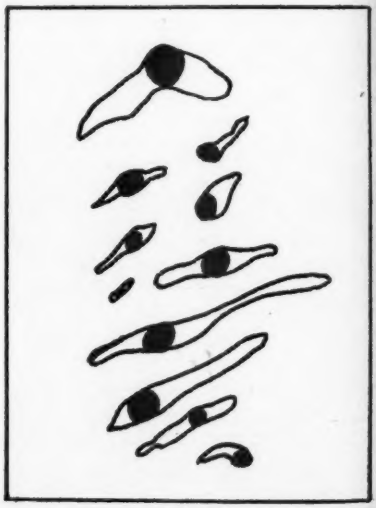
About 50° Fahrenheit—bubbles large, fixed.

About 70° —bubbles small and move freely. They continue to get smaller as the temperature rises, until at about 80° —they disappear completely.

"I can understand why they disappear with a rise in temperature, but what about the fixed position? Does the liquid turn to a solid at a comparatively high temperature?"

The specimen was forwarded to us, and we put it under the microscope—about 36 X, using transmitted light from beneath the stage. A row of odd shaped, roughly parallel "feathers" appeared, each containing a stationary bubble, taking up approximately 16% of the space, and completely filling the cavity from side to side. The heat from our illuminating source was enough to warm the specimen and create the effects Mr. Snyder described. Peculiarly, all disappeared at almost the same instant, regardless of their original size, or the size of the cavity. We then placed an ice cube alongside the quartz, and the process was completely reversed. As the specimen cooled the bubbles appeared, moved freely, grew larger, moved less freely and for shorter distances, and finally came to rest.

We tried to figure this one out, and came to the following conclusion, which may or may not be the true explanation. That the bubbles are not air or gas, as would be expected, but are, in fact, vacuums. That a liquid was imprisoned in the quartz magma during its cooling (The material was obtained from a pegmatite, and probably came up in a molten state.)



Fluidal cavities and movable bubbles in quartz. When viewed from an edge of the specimen the cavities are very thin and are in the same plane.

and in contracting, left a vacuum. That at 50° the bubbles are large and seal the narrow side entrances to the cavity (see sketch) preventing the liquid from flowing. That as the temperature rises the liquid expands, the bubbles become smaller and fit readily into the narrow parts of the cavity tube, finally disappearing as the liquid expands to fill the cavity completely.

Bastin, in his "Geology of the Pegmatites and Associated Rocks of Maine" (Gov't Printing Office, 1911, Bull. 445) at page 19 discusses fluidal cavities in Maine pegmatites. He shows diagrams of vugs remarkably similar to those here discussed, but states that they show up at 360 magnifications, whereas these can be seen at about 15 X. Nowhere, however, is any mention made of disappearing bubbles, and these seem to be unique.

Returning to m/m boxes; Cargille, of New York, has finally put the plastic ones on the market at a reasonable price. These are good. And for the specimens for which you want completely opaque boxes, he furnishes, at no extra charge, black paper inserts. He has three sizes, which can be obtained separately or as an assortment.

Dr. Charles R. Toothaker, curator of the Philadelphia Commercial Museum, contributes a worthwhile device. The late John A. Grenzig developed a similar tool, which will be discussed in a later issue. Dr. Toothaker's letter follows.

"I have read your article on THE MICRO MOUNTER in ROCKS AND MINERALS." The universal stage is excellent. I want to add one thing that I find is often helpful. I am looking at a micro mount and want to show it to someone else. Of course a revolving table is a convenient thing but not everyone has a revolving table.

"I took 2 pieces of hard wood 7/8 inches thick and about 2 feet in diameter, more or less. I bored a hole in the center of both and put in the hole a bolt with the head and the nut countersunk. On the lower side of the bottom board I cemented a piece of felt. On the lower side of the upper board I drove in 4 domes of silence, the sort of thing that you put on the legs of a chair so as to move it around easily. I gave the upper surface of the lower board a good coating of floor wax.

"I set my microscope on this. The upper board spins easily enough on the lower board. Now if I am looking at a micro mount my friend sits alongside me and I just turn the upper board on the lower one and we can both observe without either of us leaving our chairs. . ."

Many thanks for the data. We are most grateful for ideas and suggestions.

Rock Filming Machine Invented

TULSA, Oklahoma, December 17, 1948—A new machine developed by Stanolind Oil and Gas Company may make it possible to take motion picture "tours" through the inside of rocks.

The device is a Cinematome machine. Its inventors hope it will aid the study of oil-bearing rock formations. If so, it may provide some of the answers to the problem of getting more oil out of the ground.

Most oil deposits are found in porous rock formations thousands of feet underground. But the oil can be produced only if there are enough tiny holes in the rock—holes which are connected together—to let the oil droplets move through the rock layer to the well bore.

The Cinematome machine is adding to scientists' knowledge of rocks and how oil moves through porous formations. By studying the pictures, scientists can better understand the physical steps in the production of oil. They can see how oil gets trapped in dead-end pores. And they may be able to devise new ways to cut down this trapping.

The machine combines a camera with a diamond grinding wheel. The wheel can be adjusted so that slices of rock only 1/30 as thick as a newspaper page can be removed.

The rock to be "filmed" is a sample taken from an oil-producing formation. First it is cleaned and saturated with a dark-colored plastic. Then it is mounted on the machine. Successive layers of rock are removed automatically by the grinding wheel. After each layer is shaved away, a single frame picture is taken on motion picture film. When the film is run through the projector at normal speed, the rock appears to melt away. The result is like a colored movie of a tour through a rock.

The feeding of the rock into the grinder is all automatic. The machine has two electric motors: One moves the rock past the grinding wheel and into places in front of the camera; the other drives the wheel. The rock is wet while the grinding is done. Its face is dried with an air blast before each picture is taken.

COLLECTORS' COLUMN

Conducted by A. CAL LECTOR

This column, which began with the Sept.-Oct., 1948, issue, is of special interest to beginners in mineralogy, as we comment briefly on one or more of the common minerals. In the last issue we talked on albite, one of the feldspars. This time we will take up amphibole, which is the group name for some very common minerals of which hornblende is the most important.

AMPHIBOLE

Amphibole: From the Greek for "equivocal," a name given by Haüy, a French mineralogist, on account of its doubtful character which arises from its resemblance at times to other minerals (black hornblende crystals, for example, sometimes resembling black tourmaline crystals). Not only do amphiboles furnish a number of most interesting specimens, but they are one of the most important rock-forming minerals (minerals which form rocks). Of the many amphiboles (all silicates), the following four are the most important.

Actinolite: This is a greenish mineral (varying from grayish-green to dark green in color) and is commonly found as radiating crystals in schists. The actinolite specimens found in the crystalline schists of the Alps, as at Greiner in the Zillerthal (Austria), and at Zermatt, Valais, (Switzerland), are among the finest known. Many fine specimens are found in the United States ,one of the best localities is the talc mine at Chester, Vt., where beautiful specimens of interlaced long, bladed, dark green crystals penetrate talc in all directions.

The name, actinolite, comes from two Greek words for "ray" and a "stone", meaning ray stone or radiated stone, because the mineral is commonly radiated.

Asbestus: Name is from the Greek for "incombustible." This interesting variety is often found in long, flexible threads or fibers, which are commonly white in color but may be grayish, greenish or brownish. One of the famous localities in the world is the Williams serpentine quarry at Easton, Penn., where the mineral has often been found in long, white, and very flexible fibers in the serpentine.

Hornblende: This is the most common of the amphiboles and occurs chiefly as dark green to black in color. It often forms nice crystals but is more commonly found in crystalline, cleavable, or massive form. Its localities are so numerous that the mineral is found everywhere. Arendal in Norway; Pargas, Finland (pargasite); Willsboro and Tilly Foster, N. Y.; Riverside, calif., are only a few localities where good hornblendes are found.

The name "hornblende" is partly from its extreme toughness, in this respect slightly resembling horn (hence hornstone), and partly because from its great specific gravity, miners frequently mistook it for a metallic ore. German miners applied the term "blende" to any heavy lustrous mineral which was not an ore (blende in German means blind, deceive).

Tremolite: Named for Tremola Valley, on St. Gothard, Switzerland, where it was first found.

Tremolite is commonly in white to gray crystals and found chiefly in limestones. It, too, is very common and found at many localities throughout the world, perhaps the most noted foreign locality is Campolongo, Canton Tessin, Switzerland, where fine crystals occur in dolomite.

In the limestone quarries at Canaan, Conn., tremolite occurs in such lustrous, fibrous (needle-like masses) as to make beautiful specimens, but its needle-like crystals are so sharp that the mineral must be handled with extreme care to prevent sore and bleeding fingers.

Among other varieties of amphibole may be mentioned *byssolite,* an olive-green, coarse and stiff fibrous mineral, whose important locality is the abandoned magnetite mine at French Creek, Chester Co., Penn; *edenite,* white-to-grayish and

greenish masses found in the limestone deposits at Edenville, Orange Co., N. Y.; *hexagonite,* a pinkish variety found in the talc mine at Fowler, near Edwards, St. Lawrence Co., N. Y.; *mountain leather* thin flexible sheets made up of interlaced fibers, white to gray or yellowish in color (when thoroughly wet it resembles wet leather), an important locality is the limestone quarry at Patterson, Putnam Co., N. Y.; *smaragdite,* a greenish variety occurring chiefly with the corundum deposits in North Carolina, as at Buck Creek, Clay Co.

One or more specimens of each variety of amphibole should be represented in a collection. All dealers in minerals carry nice specimens in stock which may be purchased from 25c up to $2.00 each (of course some unusually fine specimens would be priced higher).

Memorial of Horace S. Williams

An honored member of the New York Mineralogical Club, Horace S. Williams died June 27, 1948, at the age of 81. He was born in Haddam, Conn., Jan 6, 1867, and never married. A nephew, Richard F. Williams, of Haddam, survives.

In the late eighties Mr. Williams found in a surface pocket at Haddam Neck, Conn., a lot of green tourmaline crystals some of them six or seven inches long, clear and gemmy, for which he refused an offer from Tiffany and Company of $1500.00. Later he sold these.

On agreement that he might purchase all "precious minerals" found there-in, he engaged as a workman in the feldspar quarry on Haddam Neck belonging to Stephen Gillette. He found many fine gemmy tourmalines there and also at Long Hill, and Tims Hill. They were white, pink, parti-colored but mostly dark green.

Haddam is on the Connecticut River near Long Island Sound and at an early age Williams to use his own words was "two years before the mast." This probably accounts for his later working for the U. S. Geodetic rather than the U. S. Geological Survey. At one time he was assistant to Professor Rice of Wesleyan University.

He sold most of his mineral finds to George L. English then in the mineral business in New York City. Mr. English soon hired him as a traveling collector. This was much more pleasing and profitable than quarry work.

His first trip was to Iceland where he bought the large accumulation of a collector after which he went to Europe; then to Virginia and later to Japan, Korea and China. On all these trips he was very successful, between times working in the store of English.

A second trip to Japan was made for Wall Street interests during the first world war before the U. S. got into it. Another trip to Japan was made for Lovat Fraser and the Harris Laboratory of New York City to buy and ship tungsten to them. During the first war the Japanese government engaged Williams to report on their copper properties.

While in Tokyo he discovered that a German Syndicate was shipping from there cartridges and munitions to Germany. He notified the American and British Consuls and a British warship overtook the shipment.

At one time Williams made a careful survey of the feldspar occurrences of Middlesex Co., Conn. Later he made analyses of coal samples for the Harris Laboratory.

Of the many specimens he collected at Haddam Neck, the tourmaline remaining in the family was purchased from his nephew by Dr. Alfred C. Hawkins and Gilman S. Stanton jointly. In the lot were many small, often terminated or doubly terminated, clear crystals, of the various colors or parti-colored, a few were three inches in length. In the lot was one translucent white beryl 2 x 1¼ inch; also the termination of a large opaque morganite.

Perhaps most notable was an indicolite, brilliant cut and set in a ring owned by Mrs. Richard E. Williams. It is about two carats in size and I have never seen a more beautiful deep blue indicolite.

For the American Gem Co., Mr. Williams worked an amethyst deposit near Arrington, Va., an emerald-matrix and aquamarine near Spruce Pine, N. C. This Company sent him to Brazil for gem material. As on all his expeditions, he obtained large quantities.

Recently he drafted maps showing the mineral localities at Haddam, one for this Club and the other for the Haddam Library.

Mineralogy owes much to Mr. Williams who for small financial remuneration added very many to the world's fine specimens.

(Read at the Nov. 17, 1948, Meeting of the New York Mineralogical Club held at Columbia University, New York City, by Gilman S. Stanton who is indebted to Lovat Fraser for some of the information.)

WHY DO I LIKE TO BUY FROM DEALERS

Being amateurs in Rock and Mineral collecting we are delighted to have this opportunity of telling of our experiences with the dealers who advertise in *Rocks and Minerals*. We have dealt with these almost exclusively and have been more than pleased with the specimens sent us and the courtesies extended us.

We have bought small specimens—we like the 3 x 4 inch size best—and usually our orders to any one dealer are small because variety is necessary to our aim which is to "learn" and not merely to collect for beauty or show. By making use of the specials offered each month, we have bought from the majority of advertisers.

And we have found that if the order is for one stone only and amounts to no more than $2.50, it is wrapped and addressed as carefully as if it were a $25.00 order. And oftentimes directions for polishing, or, little notes about the mineral, are included. We find these very interesting and very profitable to our aim. Besides this, we have often found a surprise specimen in our package which is always a welcome gift from a dealer.

We find it especially helpful when the minerals which go to make up the specimen are named in the ad or the names are included in the package. Wish it were done even more often.

We think dealers are grand people and would like to meet them personally sometime. Maybe we shall—some day.

Mr. and Mrs. Paul A. Bens,
Box 664,
Aberdeen, So. Dak.

Sept. 23, 1948

Why do I like to buy from dealers? I can scarcely do otherwise. I am one the surely large group which has neither the time, the experience or the money to go prospecting. Especially since our community seems to have an amazing dearth of desirable minerals or crystals.

My work does not allow me to go far from home except for our vacation. However almost daily my thoughts turn to those bits of God's handiwork and while it is a joy to display and behold the few I have picked up, I am sure I wouldn't be able to wait a whole year to acquire some more. Fortunately for my peace of mind (and perhaps sanity) every two months the postman extends my reach, not only out to the favored spots of our country but to the far corners of Mother Earth. Even a glance at the cover of R. & M. brings such exotic names and places as Colquechaca, Bolivia, or Esperanza Mine, San Antonio de los Cobres, Argentina, or to Roumania, Ceylon or where you will. What is my chance of ever picking up a piece of silver at Colquechaca? Need I answer?

I am a minister and among many other things my eduction is sadly lacking in geology and mineralogy. Of course I have learned to know a few crystals and minerals by sight but only on the authority of what others have told me. Not only from my personal friends but from those via Uncle Sam's mail carriers. We live on the edge of the glacial region and I have pawed through several gravel piles bringing home some sacks full of stones. Heaven only knows what they are and I'm sure that they are not worth sending away to find out. So with perfect confidence, if I want some pyrargyrite I just send to a dealer and let him worry about its identity.

I needn't remind anyone of the present difficulty most people have of stretching our 'incomes' over the 'outgos'. It must be gratifying indeed to go and dig out your own specimens but this is a luxury I can't afford. Neither is it good sense. When you have a choice between an expensive trip and an unknown amount of bounty or no trip but many packages of real Christmas delight, it isn't hard for me to choose. Anyway to compensate my wanderlust I can always go along at the side of Mr. Horace W. Slocum and I won't get disappointed either.

Last but far from least those are real gentlemen out there on the other end of those addresses. I know, I have had a

few personal problems in which they treated me like a brother. Already in the short time I have been affected with the 'fever' I have found some close friendships which have enriched me both spiritually and physically. Because some might try to take advantage of their generosity I won't mention their names but their ads are there in every issue.

May God bless them. May He prosper them.

John E. Sparks, Pastor
First Christian Church
of Madison
619 W. Main St.
Madison, Ind.

Oct. 1, 1948

QUESTIONS and ANSWERS

Ques. "May I inquire whether or not binders are available for Rocks and Minerals.."——E. M. H., Pitman, N. J.

Ans. No binders are available.

Ques. "Any brief mention of dealers, clubs, or collecting areas within 100 miles of the District of Columbia would be greatly appreciated. My interest is chiefly in gem stones."——C. A. B., Washington, D. C.

Ans. We know of no bona fide mineral dealer within 100 miles of Washington. A very active mineral club is in your city, the Mineralogical Society of the District of Columbia, which meets on the 3rd Friday of the month at the U. S. National Museum. There are a number of interesting mineral localities around Washington of which the Goose Creek trap rock quarry is the most famous.

Ques. "Is there any book, circular or pamphlet published that deals with minerals of Minnesota, giving localities?"—E. S. O., Battle Lake, Minn.

Ans. Yes, there is one. It is "Mineral Resources of Minnesota (Bulletin 30), published by the Minnesota Geological Survey, Minneapolis, Minn. Price $1.00.

Ques. "I have seen a few good local collections in which most of the specimens were collected personally in the field. My collection is a very poor one. If I were to buy nice specimens from dealers, would it be proper to put my own labels under them and say I collected the specimens personally or should I be honest and admit they were purchased from dealers?"——M. R. B., Los Angeles, Calif.

Ans. For heaven's sakes don't be ashamed to admit that you purchase minerals from dealers. There is no disgrace in doing this! Every collector is not lucky enough to find good specimens but every collector can buy good specimens from dealers. The merit of a collection is not measured in how it was gotten together but what it consists of. If you buy specimens from dealers, you may put your own labels under them, so that all labels in the collection may be uniform, but don't be ashamed to admit they were purchased.

No Mistakes in the Mineral World!

Editor R. & M.:

I am enclosing another year's subscription for *Rocks and Minerals* and trust the exchange and so on will be in order. It is quite a formality in these days to get anything changed into dollar currency.

I must congratulate you on the many interesting articles you have published in the last two or three numbers. One in particular impressed me very much indeed, viz., "Religion and the Mineralogist." It has always been a mystery to me that anyone with the slightest knowledge of mineralogy could possibly be an atheist—there are no mistakes in the mineral world.

Sorry to know that *Rocks and Minerals* will for a time be bi-monthly.

My very best wishes and good luck to you and R. & M.

T. Edgar Simmons
Benoni, Transvaal, South Africa
Oct. 25, 1948

THE HISTORY OF THE HOBBY HOUSE

By FLORENCE A. HOLDEN
(B. S. Cornell University)

While teaching science in a Passaic public school, I began to make up a portable museum of rocks and minerals. The specimens were mounted with their stories in glass-covered cases under such topics as Copper Ores, Zinc Ores, Minerals Used in Making Steel, Aluminum Minerals, The Quartz Family, The Calcite Family, The Feldspars, Granite, Petrified Wood, Coal Age Forests, Fossils, Decorative Stones, Ornamental Stones, Industrial Minerals, Igneous Rocks, Sedimentary Rocks, Metamorphic Rocks, and Rock-forming Minerals.

The stories were written in simple English, much of the material having been first written by the children in my sixth grade classes as a project for Education Week. During Educational Week this museum, together with individual projects worked out by the children, was exhibited in the science room. The exhibit not only aroused a great deal of interest among the pupils and teachers of my school, but so interested the city supervisors that they invited the faculties of other schools to come and see it. A description of the exhibit was published in the city paper and teachers and principals from nearby cities came to see it. Many of them remarked that such an exhibit should not be confined to one school, but that children and teachers all over the country should have a chance to see it.

When I showed the children in my classes specimens of rocks and minerals about which we were studying, several of them asked me if I would break off a small piece to sell to them for a penny or two, because they wanted to make a chart to take home. This idea soon spread and I found my samples rapidly diminishing in size. To supply the children, I began spending my vacations collecting rocks and minerals from quarries and mines throughout the country. Several teachers and some scout leaders asked me if I would make up sets of the little pieces, together with the outline that I had mimeographed for my classes, to sell at a reasonable price.

To help create an even greater interest in the uses of rocks and minerals, I worked out a fluorescent demonstration, called "Black Light Magic," which included, not only minerals that changed color and glowed in the dark, but also many objects, such as a hand painted couch cover, pillow slips that changed both color and design, pictures, placques, table scarfs, novelties, and dress material. I showed the children how to have a spooky Halloween party, how the army, navy and police used fluorescence; how spectacular effects are produced on the stage and the circus. I ended the demonstration by showing how we now use or in the future will use fluorescence in our homes.

The reaction to this demonstration finally convinced me that I should take this "Black Light Magic" demonstration, my museum, and the educational mineral sets on a tour of the country.

As I went around the country, showing my exhibit, I continued to collect more material and in a very short time I decided that I would have to have a permanent location. So I began to look for the ideal spot. After having traveled in 45 states and visited all the National Parks, I finally found that ideal spot in The Shepherd of The Hills Country in the Ozark Mountains of Missouri. Here in a beautiful oak grove I have established a permanent educational museum which is free to the public. I have also built rock picnic tables and an outdoor fireplace, and planted flowers and berry plants.

My material for the "Black Light Magic" demonstration I have arranged in a dark room in back of the museum. This room is called "The Mystery Room", and is a source of amazement and delight to all who have seen it. Some children have come back to see it several times. Some adults have remarked that it is one of the most interesting and colorful sights they have ever seen anywhere. Many people have said, "I just can't believe my eyes. How can one light (filtered ultra-violet)

(Continued on page 61)

SCREENING OF VISUAL AIDS HELD BY PUBLISHERS

In conjunction with the publication of PHYSICAL GEOLOGY, third edition, well-known geology textbook written by Chester R. Longwell, Adolph Knopf and Richard F. Flint, John Wiley & Sons have issued a new set of 250 custom-made color slides to assist the many college and university geology instructors using the book in teaching their courses. At a preview showing of a large number of the slides in this series held at the Hotel Commodore in New York City, on Monday, September 27, 1948, Dr. Ned L. Reglein, director of the Wiley visual aids department, stated that "the development of this set of visual aids, believed to be as comprehensive a collection as has ever been made available generally, marks an important forward step in the improvement of geology teaching."

Outlining the history of the preparation of this series of color slides, Dr. Reglein reported that it was decided to start from the beginning and obtain views which exactly depict what is described in the book rather than rely upon already existing materials. Consequently, Professors Longwell, Knopf and Flint, all of whom are members of the Yale University faculty, set up individual specifications for each picture to be included in the set. Dr. Orlo Childs of the University of Wyoming, a geologist who is also an experienced cameraman, was engaged to make the necessary field trip and to take the required pictures. Four months later, with a 21,000-mile trip behind him, Dr. Childs returned with about 800 color photographs. Out of these, the authors of PHYSICAL GEOLOGY and Dr. Reglein selected the 250 best examples illustrating the principles set forth in the book.

The slides are arranged to follow the general chapter pattern of the book for which they were designed. After illustrating the chapters entitled "Geology, the Science of the Earth" and "The Method and Scope of Geologic Study," the series continues with pictorial representations of weathering, erosion, running and subsurface water, glaciers and glaciation, sedimentary and igneous rocks, volcanoes, earthquakes, metamorphism, the origin and history of mountains, land forms and mineral resources. The complete set includes general scenes, many of which are aerial photographs, as well as close-ups of typical formations and specimens. Colorful to excite interest and grainless to allow for great screen expansion, the slides aim at providing a clearer understanding of the elements of a particular problem and furnishing easier visualization of theoretical concepts, as well as at making learning more lasting. They are made of unbreakable film and are sturdily bound into the new plastic mounts. The 250 slides come in a convenient package, weighing about three pounds, and are accompanied by a useful instructor's manual offering suggestions for using them correctly. Complete captions are printed in the manual, keyed both to the slides in the package and to the text of the book. The price of the entire set is $85.00. For sale by John Wiley and Sons, Inc., 440 4th Ave., New York 16, N. Y.

Psychology Slides Also Issued

The PHYSICAL GEOLOGY slides make up the second presentation of the John Wiley & Sons visual aids program. In August the company issued a set of slides, a motion picture, a recording and a filmstrip to accompany another book, FOUNDATIONS OF PSYCHOLOGY, edited by Professors Edwin S. Boring, Herbert S. Langfeld, and Harry P. Weld and published in May. Developed expressly for this book, the psychology visual aids have been received enthusiastically by colleges and universities throughout the country. The third offering of the Wiley visual aids department will be a comprehensive set of slides, also to be prepared by Dr. Childs, to supplement the forthcoming fifth edition of HISTORICAL GEOLOGY, by Carl O. Dunbar and the late Schuchert, to be published early next year. Other projects now being planned by the publishers include visual aids for future books in biology, chemistry, physical geography and botany.

Dr. Reglein has been developing these programs since joining the publishing company in November 1947. Prior to his present association, he was production manager for Teaching Films, Inc., New York. During the war he served five years as an Army Air Forces officer in the manufacture and development of training films, slides and similar specialized devices, attaining the rank of lieutenant-colonel. A graduate of the State University of Iowa, he also holds a master's degree and a doctorate in education from Indiana University.

BIBLIOGRAPHICAL NOTES

Selected Mineral Specimens: This is the latest mineral catalog of Schortmann's Minerals. It is a handsome publication of 63 pages, 6 x 9 in size, with many selected mineral specimens listed. The minerals are arranged alphabetically beginning with actinolite from Vermont (p. 7) and ending with zoisite from North Carolina (p. 39). Each mineral is described briefly, sizes listed with prices. Rare minerals or minerals from popular localities are a feature of the catalog.

Crystals (pp. 40-43); mineral collections (pp. 44-46); fluorescent minerals (pp. 47-54; fluorescent lights (pp. 55-58); books on minerals (pp. 59-61); and mineral hammers (p. 62), round out the rest of the catalog.

This very fine catalog sells for 25c a copy (money refunded on the first order of $2.00 or more) and is issued by Schortmann's Minerals, 10 McKinley Ave., Easthampton, Mass.

Crystal Models: Crystallography, the most fascinating branch of mineralogy, is often a stumbling block to beginners because of the difficulty in obtaining study models illustrating the many forms of crystals. Good models are on exhibit at leading mineral museums, but the collector wants to have a set of his own so that he can study them at his leisure and compare them with crystals in his collection .

It is most gratifying to announce that good study models are now available and at a most inexpensive price. Mr. Arthur J. Gude, 3rd, has put on the market a series of 42 thin cardboard sheets out of which 111 basic crystallographic forms may be constructed. Each sheet contains one or more drawings, representing one or more crystal forms. Full instructions come with each kit.

If you are in any ways interested in crystals, get this construction kit and construct your own models—in an easy and fascinating way.

The kit sells for $3.50 and is obtainable from its designer, Arthur J. Gude, 3rd, 19 Prospector Park, Golden, Colo.

Physical Geology: By Chester R. Longwell, Adolph Knopf, and Richard F. Flint.

The 3rd edition of this noted book has recently been issued. For 16 years it has been the standard textbook of physical geology in American colleges. In the new issue the entire text has been critically analyzed, many chapters revised, a new unit, Chapter 2, been added, and many other improvements made to make this book of even more value to students of geology than ever before.

(In conjunction with this book, the publishers have issued a set of 250 colored slides showing geologic features that illustrate nearly all aspects of physical geology. The set sells for $85.00.)

Physical Geology is 6 1-4 x 9 1-4 inches in size, contains 622 pages, 365 figures, sells for $5.00, and published by John Wiley & Sons, Inc., 440 4th Ave., New York, 16, N. Y.

Walter O. Snelling Appointed To AEC Advisory Committee

Walter O. Snelling, consulting chemist and Director of Research of the Trojan Powder Company, Allentown, Pa., has been appointed to the Atomic Energy Commission's Advisory Committee on Raw Materials, it was announced Dec. 31, 1948, by John K. Gustafson, Manager of the AEC's Raw Materials Operations Office.

Mr. Snelling has been Director of Research of the Trojan Powder Company since 1917. He also has served as a consulting chemist in connection with investigations of oils, oil products and explosives and holds more than 150 patents covering inventions in the fields of chemistry and explosives.

Mr. Snelling holds B.S. and Ph.D. degrees from George Washington University, a B.S. degree from Harvard University, and an M.S. degree from Yale University. He was born in Washington, D. C., and makes his present home in Allentown.

The Raw Materials Advisory Committee is presently composed of seven members. Dr. Donald H. McLaughlin, President of the Homestake Mining Company, Lead, South Dakota, is chairman.

CLUB AND SOCIETY NOTES

ATTENTION SECRETARIES—If you want your reports to appear in the March-April issue, they must reach us by Feb. 15th—the Editor.

Worcester (Mass.) Mineral Club (Annual Report)

As the Worcester Mineral Club reviews the past twelve months we feel considerable satisfaction from its activities under the able leadership of its president, Mr. Joseph D. Shea of Clinton; and the other officers who have served with him, Mr. Norman Taft, Vice-President; Mr. Evart Pearson, Cuator; Miss Getrude Bryant, Sec.-Treas.; Miss Emily Bryant, Librarian; Mr. Leo Morriseau, Mr. Raymond Newman and Mr. Pearson, of the Program Com. and Mr. William Wood, Chairman of Publicity.

During the year our membership has not been static. We have lost one member by death, Mr. Carl Edgren; a few others by removal or because of the press of other duties, but we have gained even more, to the number of twenty. The total membership now stands at 52. Membership books containing the member list with addresses has been distributed to most of these people.

With meetings twice monthly, including the summer months, each meeting has included one or more interesting feature. We have had several speakers from outside the club. Mr. Benjamin Bernstein of the South High faculty spoke upon the famous diamonds of history and exhibited replicas of many of them. Dr. Wolfe of Boston University gave us a fine talk on "Crystallography." Mr. Leo D. Otis of the Springfield Museum of Natural History, took us on an imaginary journey "Collecting Minerals in the Connecticut River Valley." A demonstration of jewelry making was given by Mr. Forbush Anderson. At a session of the club, held in the John Woodman Higgins Armory, Mr. Wilder the Curator, told us interesting histories of many of the items on display, both medieval and modern. Mr. Sherman Clark, one of our members who had recently returned from a western tour, during which he had exchanged eastern minerals for western, related his experiences and exhibited a "fraction" of the spoils. Other members have contributed from time to time items of interest from their own experience or knowledge.

We had several evenings of moving pictures. From the American Gem Society of California we received an excellent film on the mining of diamonds and twice we have viewed films on the mining and processing of aluminum. Another film, "Winter in the Desert," presented views of the American southwest.

Publicity for the Club includes the placing of exhibits in the lobby of the Public Library; at the John Woodman Higgins Armory of the Worcester Pressed Steel Co., plant; and, at the time of the Worcester Centennial, at the Natural History Museum. Radio talks were given by two of the club's members, Mr. Norman Taft, in December, and Miss Gertrude Bryant, in January. Several fine news articles appeared in the Worcester daily and Sunday newspapers. One of these gave a history of the Club and its activities and three others, well illustrated, were devoted to the collections of Mr. John Broderick, Mr. Gustaf Fyhr, and Miss Susan Ayres, all members.

The "Chiastolite" found locally in exceptional quality, was selected as the Club emblem. It was subsequently placed upon stationery which was made available to members at reasonable cost.

Field trips have been constantly undertaken by individual members, but there have been several in which a large proportion of the membership took part. In March we were the guests of Dr. Frondel and Dr. Palache at the Harvard University Museum of Mineralogy, Cambridge, Mass, where we spent the greater part of a day amidst the breath-taking collection, considered by many as "tops" in the country. While this was not a usual sort of field trip, there have been several into the surrounding country which have brought out a large number of members and provided both delightful outings and interesting specimens.

During the year we held several auctions of minerals and ores supplied to us for the purpose by Schortmann's of Easthampton, Mass. These auctions were an aid to the Club's treasury and enabled many to obtained new or desired specimens for their own collections. Several members carried on exchanges with collectors elsewhere. Among other activities might be mentioned demonstrations in hand lapping given by Mr. Norman Taft, and of the Geiger Counter by Mr. Betty of Baldwinsville, and several displays of fluorescent minerals by Mr. Fyhr. Mr. Fyhr also brought in on two occasions, selected groups of twelve mounted specimens for "identification contests," at which some of us had more enthusiasm than skill. An exchange of specimens, gaily wrapped and placed about a decorated tree, highlighted the Christmas meeting.

It would take too long to enumerate the many other activities which have added to our enjoyment of the club meetings. All members have contributed of their time and energy, and not the least being the group of ladies who have topped off the more festive meetings. We all feel that it has been a delightful and satisfying year in every way.

Gertrude M. Bryant, Sec'y
By W. P. W.

Georgia Mineral Society

On Monday evening November 1, 1948, the regular monthly meeting of the Georgia Mineral Society was held in Atlanta, and the attendance was very gratifying as some 60 members and friends were present to hear Dr. J. G. Lester of Emory University deliver a talk on "Uranium and how to find it." Dr. Lester's talk was most interesting, informative, and timely in view of the present world situation and the need for new sources of this mineral.

The Governor Chas. S. Osborne prize was presented to Charles Webb for the most outstanding achievement of a junior member during the past year in organizing an Earth Science Club at his local High School. The prize consisted of five very choice mineral specimens.

Dr. Furcron, our field trip Chairman, announced a field trip for Saturday November 13, to Ballground, Ga., in Cherokee County, to collect Staurolite and other minerals. This trip should be most interesting and profitable for all who attend.

As this was the first meeting of the new year for the Society, our new president, Capt. Garland Peyton, appointed Chairman of the various committees as follows: Mr. E. E. Joachim, Gem Section, to succeed himself; Dr. Frank Daniel, membership; Dr. Lester, Dr. Mitchell and Dr. Furcron, co-Chairman of the program committee; Dr. Furcron, Field Trip and Charles Webb, Junior Membership.

December Meeting

The best attended meeting in several years was held on Monday Evening December 6, 1948; extra seats had to be provided in order to accommodate the overflow.

Several new members were introduced to the Society, also many visitors were present and we were fortunate in having with us: Dr. Stewart J. Lloyd, Ass't. State Geologist of Alabama; Dr. Hugh D. Pallister, Geologist; Mr. David DeJarnette, Curator Alabama Museum of Natural History and Dr. Valentine, Entomologist, of Highlands, N. C.

The Speaker of the evening Dr. Walter B. Jones, State Geologist of Alabama, was then introduced by President Peyton. Dr. Jones discussed the "Precious and Semi-Precious Stones of Australia." Dr. Jones served in that district during the last war as a Colonel in the regular Army but was engaged much of the time in the business of procuring water for the Army. It seems that water is Australia's big problem, and he pointed out that much of the continent was unexplored geologically.

After describing briefly the discovery of some of the famous large nuggets, he discussed the sapphire deposits of Queensland where a placer lead 27 miles long occurs. The mining of sapphires is an important industry and this is the only field where green, yellow, orange, red and parti-colored sapphires are obtained.

Alluvial diamonds are found in Victoria and New South Wales. Thus far there has been little attempt at real mining of diamonds. and no volcanic plugs have been dscovered yet as the source rock for them.

As would be expected, Dr. Jones spent more time upon opals than the other gems. He described Lightning Ridge where this gem has been mined for many, many years and it is from here that the famous black opals from New South Wales are obtained. The miner obtains a lease upon a piece of ground about 40 feet square. sinks a shaft about 40 feet coming to a bed of sandstone. After passing through this bed of sandstone opals may be discovered beneath it. It is a matter of pure chance. He described the finest specimen from the area as being about the size of an egg broken into a skillet. The outside border representing the white of the egg is yellow and the yolk is black. The old prospector who discovered this particular opal received a very large sum for it—about $320.00. The present owner in Sydney has it up for sale but is by no means anxious to sell it; his tentative price is five thousand pounds. Incidentally these opal deposits were described in a recent article in *Rocks and Minerals* (Impressions of Lightning Ridge, Australia, by S. J. Squires,, November-December 1948.)

Among other gems Dr. Jones mentioned Zircon of New South Wales and Queensland which has been mined recently. They are of alluvial origin, white, wine, pink to nearly red. Topaz of excellent quality is discovered mostly in the sapphire country. Amethyst of good quality is found in many places over the east-central part of Australia. Tourmaline clear green and pink, looking very much like the Pala, California, material, is found in Queensland and New South Wales.

Agate they refer to as ribbon stone and Dr. Jones had on exhibit specimens of it. It is extremely beautiful agate. It seems that it was neccessary to take a trip north to Darwin, and when the engine gave out somewhere in the desert, northwest of Cloncurry, there happened to be a landing strip about 500 miles long at that place, and in this particular case it was possible to ground the plane. While the pilot puttered around fixing up said plane Dr. Jones walked out and collected about half of a flour sack of these ribbon stones.

Pearls of great beauty are found at the western tip of the continent, near Broome. The Australians do very fine work in carving mother-of-pearl which is obtained from several species of clam discovered in the great barrier reef district. One of the most preferred is the gold lip shell, and this shell supports a very thriving industry in pearl buttons. The black lip shell is also much sought after. These pearl shells, incidentally, make the finest mother

in New Guinea, just north of the reef, where a native will work all day for a piece of shell worth four cents at Darwin.

S. C. Knox
Corresponding Secretary
2142 Memorial Dr. SE.
Atlanta, Ga.

Pacific Mineral Society

Dr. Marc F. Baumgardt, who was director of the Clark Observatory for 21 years and is a Fellow of the Royal Astronomical Society of Great Britain, Honorary Member of the Astronomical Society of Southern California, Member of the Board of the Los Angeles County Museum, and Past President of the Academy of Science, entertained the Pacific Mineral Society with a very interesting lecture on Historical Geology. Dr. Baumgardt also showed slides which were hand colored and depicted the life on this earth from the beginning of time to the present age. In the beginning, the earth was in a nuclear stage and at this time, the earth was without air and light. This was during the Azoic Eon and the word Azoic is from Greek meaning without life. Planets have a desire to fly off into space, but the sun pulls them back. Gravitation pull of two planets will cause great disturbance on the smaller one when they get too close to each other, causing it to hurl out large masses of material which freezes into space. The moon is not large enough to have air and has a weak gravity. The heavier bodies are nearest the sun with the earth being the nearest and having a gravity of 5.52.

The distance between the planets is measured by light years. Dr. Baumgardt stated that man has only been on this earth approximately 500,000 years which is equivalent to two seconds on the clock of geology. Fossils are known as geologists time markers, and the first fossils that were found, were Trilobites of the Cambrian Period. They had compound eyes and were the first shell-like formation substantial enough for fossilization. The earliest type of life were Marine Faunas of the pre-Cambrian Era and previous to this, it is thought that any life would be in Jelly-like masses and not lasting enough to leave any history of them. The earth is going through a constant change and there is great pressure within, (approximately 125 tons per square inch 35 miles down) which is relieved by earthquakes pushing upward and by volcanoes throwing out lava. Some of these formations crystallized such as the Devil's Post Pile in the Mammoth Lakes area and they in turn show glacial scratches of our ice age about 25,000 or 30,000 years ago. California is considered a geological wonderland. The walls of the Grand Canyon show markings of very ancient geological time, when there were different stages that the earth was covered with floods, sand, limestones, and etc.

The colored slides showed us what life was like with giant plesiosaurs which were 30 feet in length, pterosaurs, and giant turtles which were 12 feet in length and width. One slide showed a dragon fly of the carboniferous era and history tells us that at that time, it was common for them to have a wingspread of 29 inches. He then showed pictures of the warm blooded animals of the pliocene and pleistocene era which consisted of saber tooth tigers giant ground sloths, mastodons, and he told of a super-giant condor that inhabited this country and had a wing-spread of 15 to 18 feet. The remains of many of these warm blooded have been removed from the Brea Tar Pits at Los Angeles, California. Last on the program was the age when man entered the picture and the various stages of his developement both mentally and physically including that of the Neandertal man and Homo sapiens with their skill in the stone age.

Dr. Baumgardt had on display, Dinosaur eggs known as Brotoceratopis eggs from Manchuria and were of the Jurassic period. They are cucumber-shape and stand up on end in a radiated form in the sands for hatching. He also had Fossil Coral, Trilobites, Brachypods, Petrified woods, fern leaf imprints of the Carboniferous age, leg bone of a saber tooth tiger, which was found in the Brea Tar Pits, and his rarest fossil was that of a star fish which had been found in Red Rock Canyon, Calif. and was of the Ordovician period of the early Paleozoic era. Dr. Baumgardt complimented Dr. P. A. Foster on his educational display of fossils consisting of the following; Eozoon—(fossil seaweed which was the earliest known form of life), Trilobites—Cambrian Period of Paleozoic era, Pentremites—Paleozoic, Blastoidea—Carboniferous, Favosites favosus—Silurian Period of Paleozoic era, Nemathelminthes—Cambrian to present, Graptolite—Upper Ordivician, Ogygopsis Klotsi—Cambrian, Ptycopara Kingi—Cambrian, Phacops Iogani—Silurian to upper Devonian, Belemnite—Jurassic to Cretaceous.

Mrs. A. E. Allard, Pub. Chmn.
3133 Live Oak St.
Huntington Park, Calif.

Gem & Mineral Society of Madison, Ind.

A new rockhound club, the Gem and Mineral Society of Madison, Ind., was recently formed. At its Nov. 1st, 1948, meeting in the Jefferson County Historical Museum, in Madison, it was decided that meetings would be held the first Monday evening of each month at 7:30 p.m.

The following officers have been elected:

Rev. John E. Sparks, President; Mr. Brooklyn Cull, Treasurer; Mr. George A. Owens, Secretary.

A field trip and a visit to the Cincinnati Mineral Society at Cincinnati, Ohio, have been planned.

Geo. A. Owens, Sec.
423 E. 3rd St.,
Madison, Ind.

Newark Mineralogical Society, Inc.

The 258th regular meeting of the Newark Mineralogical Society was held Sunday October 3rd, 1948, at 3 p.m., in the Newark Museum, South Gallery of the Science Department, Newark, N. J. Program for the meeting was a symposium of summer collecting which was led by the Messrs. Edwin Bemis, Paul Kellinghausen, Leonard Morgan, Louis Reamer, Gene Vitali, Vincent Giordano, and Wesley H. Hayes.

Two large tables were covered with specimens from quarries in Pennsylvania, New Jersey, New York, and the New England States.

Each speaker gave an interesting description of his minerals. Mr. Albert White, Outing Committee Chairman, spoke of past outings and outlined plans for future trips.

Mr. Edwin Skidmore, who recently retuned from a trip to the southwest and the Denver Convention, was still enthusiastic and praised the fine cutting and polishing of the western lapidary. We are looking forward to hearing more about the trip.

Herman E. Grote
Publicity Committee

Newark & Paterson Clubs' Outing

The Newark Mineralogical Society and the North Jersey Mineralogical Society held a combination good fellowship outing Nov. 21st, 1948, to one of America's very earliest iron mines located at Andover, N. J. Arrangements were worked out by Mr. Albert S. White and Mr. William Casperson, who contacted Mr. Howard Hewitt the lessee of the several mines, who being a member, attended the outing and tried to point out the best possible strikes.

At one time, Mr. Hewitt gathered around him as many as he could and outlined the history of the mine, how it had been owned and worked by Benjamin Franklin and his brother, the part it played before and during the Revolution. Mr. Hewitt still has faith in the mine's deep mineral possibilities.

Mr. Wesley Hayes grouped all present for pictures and then everybody scattered, some disappearing in the tunnel to the sulphur mine and others to the several walls and faces of the quarry. It was an ideal autumn day and all could work without being overcome with the heat.

The mine had a reputation for large garnets at one time and as everyone set out to work, it was on each one's lips "Where are the garnets—find any garnets yet? It took Mr. George E. Hauze to show that garnets could be found when he showed up at sunset with two large pieces of matrix covered with garnet crystals.

Jasper, hematite, limonite and magnetite were to be found without much effort. The writer's choice find was a chunk of epidote.

Mr. Paul Kellinghausen found time to use a sledge on some large rocks so the younger members could help themselves to galena crystals, chalcopyrite, etc.

Mr. Leonard Morgan was lucky enough to find some clusters of gypsum.

A few of the other minerals found were calcite, quartz, zincite, and malachite.

Herman E. Grote
Publicity Chairman

Newark Mineralogical Society

A very interesting talk on the subject of "The Curious Lore of Precious Stones" was given by Mr. Oscar Smith to the Newark Mineralogical Society November 2nd, 1948. Mr. Smith's talk was a description of the sentiments and folk lore of precious stones, superstitions, symbolism, mysticism, use in medicine, protection, prevention, religion and divination, crystal gazing, birthstones, lucky stones and talismans, astral, zodiacal, and planetary.

Being our 32nd annual meeting, Mr. Louis Reamer, Sec'y, read the annual report, also minutes of previous meeting and Mrs. Edwin Bemis, treasurer, gave the annual and monthly financial report. Mr. Edwin Judd, chairman of the nominating committee, presented the slate of officers for election, which was accepted and the following officers were elected:

Mr. Paul Kellinghausen, President; Mr. Albert White, Vice-President; Mr. Louis Reamer Secretary, (Re-elected); Mrs. Edwin Bemis Treasurer (Re-elected).

Mr. Morris Weeks reported for the auditing committee.

Chairman for the outing committee, Mr. Albert White, gave a brief talk on plans for outings and it was decided to go to the famous old iron mine at Andover, N. J. Sunday Nov. 21st. The North Jersey Society was invited to join us to make it a double outing. Mr. Casperson, President of the North Jersey Society being present, accepted the invitation.

Mr. John Albanese exhibited a massive specimen of American jade and spoke of its merits and history.

Mr. Richard Milburn exhibited some of his summer collecting specimens and Mr. H. Grote exhibited two specimens of synthetic alexandrite.

Herman E. Grote
Publicity Chairman
95 Lenox St.
Newark, N. J.

Forming Mineral Club at Houston, Texas

W. V. Vietti, Box 2332, Houston 1, Texas and friends are in the midst of forming a local Rock Collecting and Lapidary Society, and will be glad to hear from Houstonians who may be interested. Already about 40 prospective members have been lined up. Some are gem collectors and others have cutting equipment. One member, Miss Virginia Hinton, is an expert cutter and polisher.

New York Mineralogical Club

Columbia University (Schermerhorn Building, New York City, Wednesday, October 20, 1948

Mr. Stanton advised the club of the death of Mr. James G. Manchester. In his will Mr. Manchester bequeathed to the New York Mineralogical Club his loan exhibit in the American Museum of Natural History. This collection will now be called "The James G. Manchester Collection."

Captain Thomas Miller and Mr. Horace Williams also passed away during the summer.

The remainder of the meeting was devoted to the collecting experiences of the members during the summer.

Mr. Lisle visited the Prospect Park Quarry, Paterson, N. J., shortly after a blast had uncovered a mineralized zone. He obtained nice crystallized specimens of stilbite, heulandite, quartz, laumontite, golden calcite, prehnite and amethyst.

Mr. Morgan visited several localities and obtained some very good specimens of spinel and chondrodite from Sparta Junction; carnelian from the Second Watchung; topaz and beryl from Lord's Hill; spodumene and watermelon tourmaline from Newry; chiastolite from Smalls Falls; smoky quartz crystals from Percy Peak; garnet from Vermont and stilbite from Pennsylvania. He also showed slides of some of the localities.

Mr. Maynard spent much time this past summer cutting and polishing cabochons of which he displayed a trayful of very attractive stones.

Mr. Stanton travelled west this summer and traded a rather poor kunzite for an ammonite, with much of the pearly shell preserved, a nice scheelite specimen and a specimen of wernerite. He also collected some gem tourmaline and beryl from Connecticut.

Mr. Sampter did some extensive collecting visiting 19 different quarries, mostly in Maine and New Hampshire. Most of the localities were pegmatites where Mr. and Mrs. Sampter collected fine beryl crystals, microcline, white fluorite, purple apatite, topaz, autunite, torbernite and various micas, zircons, phenakite, herderite, spodumene, tourmaline, amblygonite, and a fine 2 inch triphylite crystal in matrix.

Mr. Marcin also did quite a bit of travelling and visited many mineral localities collecting some of the nickel minerals from the Webster area, N. C., hubnerite from Townsville, N. C.; fine cassiterite crystals from Irish Creek, Va.; chalcopyrite crystals in calcite from French Creek, Pa.; an excellent pseudomorph of wolframite after scheelite and topaz from Trumbull, Conn.; garnet from Reading Ridge and siderite from Roxbury, Conn.

Mr. Buckingham showed some very good Kodachrome slides of his trip into Mexico, Colorado and New Mexico.

Mr. Cosminsky sent a box of wrapped specimens as a "grab bag" for the members.

Mr. Perloff believed it would be helpful if localities no longer productive of good specimens were mentioned and put the Gillette and Hale quarries in this group. However Mr. Marshall said that the New Haven Club had obtained good specimens from these localities during the past summer.

Mr. Yedlin found that some very good specimens can be obtained at the Strickland quarry.

Mr. Hauze showed a quartz pseudomorph which is being studied and about which a paper will soon be published.

Purfield Kent, Secretary

Chicago Rocks & Minerals Society

The Chicago Rocks and Minerals Society held its annual auction Saturday, November 13, 1948, at 8:00 p.m., at the Green Briar Field House, 2650 W. Paterson Avenue.

A very brief business meeting was conducted by the newly elected President, Ernst Gradolph, and during a recess of the evening, Mr. Stevens T. Norvell entertained the members and guests with color kodachrome slides taken on his vacation. Mr. Norvell drew attention to many points of geological interest so clearly exhibited in his pictures.

Chairman C. M. Brentlinger, of the auction committee, expressed satisfaction over the large quantity of good quality minerals, fossls and gem stone cutting materials donated by the Society's many wide-spread friends. There were many bidders and the evening proved to be a big success.

Helen L. Cooke
Publicity Chairman
2952 N. Lavergne Ave.,
Chicago 41, Ill.

Hollywood Lapidary Society

The Hollywood Lapidary Society held its first annual Lapidary and Gem Exhibit at Plummer Park, Los Angeles County Department of Parks and Recreation, Hollywood, Calif.

The Show Chairman announced the show was a great success. As this was the Society's first experience with a show, most of the members were surprised on the success of their first showing.

Award ribbons were awarded to members for outstanding Lapidary, Gem and Jewelry work.

The beautiful mahogany display cases were loaned to the Hollywood Society by the Los Angeles Lapidary Society and its members—thanks to them.

Mr. O. C. Barns, a guest exhibitor, had a beautiful display of lamps and dishes cut from Death Valley onyx.

Mr. Tom Virgin, President of the Society, announced he would set up a committee after Christmas to start work on its own display cases for next year's show.

Walt Shirey,
Show Chairman

Cincinnati Mineral Society

The regular monthly meeting of the Society was held at 8:00 p.m., Wed. Oct. 27, 1948, at the Cincinnati Museum of Natural History, Cincinnati, Ohio. Mr. Edgar Sarles, President, presented Mrs. Venable as guest of Miss Spellmire and Miss Edith Fox.

Mr. Sarles appointed a nominating committee of which Mr. James Clements is Chairman and including Miss Spellmire and Mr. Warren Wells, to prepare nominations for officers for the coming year.

Mr. Sarles reported having made another trip into Elliott County, Kentucky, with some others to secure more samples and data on the peridotite occurring there. He reported having definitely found the presence of graphitic clays, which would tend to support evidences of presence of diamonds in the peridotite. At present drilling operations for oil, gas, or coal, all of which are present in the sediments of this region, is being conducted in the peridotite area by private enterprise.

Mr. James Clements, Chairman of the program committee, announced the next meeting would bring to us not only Miss Brockschlager's talk on the "Turpin Indians" but a showing by Mr. Dury of the work of the Museum at the Turpin Site over a period of three years as recorded in colored motion picture.

Mr. Clements introduced the speaker of the evening, Mr. John K. Pope, one of our younger members who is giving a very good account of himself.

Mr. Pope's talk covered a very extensive tour through the West ostensibly for vacationing and sight-seeing but somehow greatly influenced by a desire to collect in the fabulous regions which up to that time had been places read about in *Rocks and Minerals* and mineral dealers catalogues.

John took us on a collecting tour covering the Buttes in Wyoming, the Badlands of the Dakotas, the Black Hills, Yellowstone National Park, the Tetons, Bryce Canyon, then down underground to the wonders of Carlsbad Caverns, then back thru the Big Rock Candy Mountains and then cross country back home. He collected a wealth of fine material all of which were represented by specimens for examination by members, and samples were also presented to members.

Following the meeting there was a grab-bag presented by Mr. Gschwind in which specimens from the famous French Creek and Cornwall mines of Pennsylvania were given out. The lucky number was held by Mr. Joseph Tressell who received the mystery package. This proved to be a fine group of fluorite crystals with inclusions of marcasite, pyrite, galena, and sphalerite, from Mundy's Landing, Kentucky.

November Meeting

The regular monthly meeting was held at 8:00 p.m., Wed. Nov. 24th, at the Cincinnati Museum of Natural History.

President Edgar Sarles introduced our guests for the evening, Mr. and Mrs. Venable, Dr. and Mrs. Wilson, Dr. Nerish and daughter.

A report of trips by members revealed that Mr. Sarles, Mr. Thomas Wiebell, and Mr. Gschwind took a trip Sunday, Nov. 21st, 1948. This trip covered a visit to Miranda Run Creek near Hamersville, Ohio. In the glacial clay which underlies a very limited portion of this creek, there was collected some very excellent vivianite crystals (hydrous ferrous phosphate). These men had the privilege which few in the mineral world have had, that is, seeing vivianite crystals clear and transparent. This is accounted by the fact that vivianite starts to alter or color immediately on exposure to conditions other than those in which it is found. Excellent crystals showing complete crystal form were secured in considerable quantity. The trip also included visits to areas affording dolomite crystals coated with chalcopyrite, Mexican onyx (aragonite), carbonaceous and silicious glauconite, and massive crystal-lined concretions from the Devonian shales.

Mr. Clements, reporting for the nominating committee, announced the following officers to be elected at the December meeting:

President—Mr. Charles L. Gschwind
Vice-President—Mr. Ralph Dury
Secretary—Miss Elizabeth Brockschlager
Corresponding Sec.—Mr. Edgar Sarles
Treasurer—Mr. Ralph Clark, Jr.

Miss Brockschlager was introduced by Mr. Clements to present the program for the evening. She gave a very thorough background for the subject "The Turpin Indians" and introduced Mr. Ralph Dury as the principal speaker.

The subject, though not too concerned with mineralogy, was of vital interest to us as Cincinnatians fortunate enough to be possessed of a wealth of aboriginal remains, and a dynamic, authoritative man like Ralph Dury to spark plug the investigation and revelation of these remains.

Mr. Dury presented a color motion film titled "The Turpin Indians," covering three seasons of intensive archaeological work, at the Turpin Site near Cincinnati. This excellent film was photographed and edited by members of the Museum Staff in such logical manner as to unfold the entire operation to date. Archaeological finds including some 64 burials in the mound proper and their accompanying artifacts, house and post-hole patterns, refuse and storage pits and fireplaces were shown in the actual sequence of their exposure.

The subject was so well covered by Mr. Dury that a resume of the subject matter required to do justice to the subject would be too lengthy for publication here. Suffice it to say that the film and the material it reveals depicts for the first time in Archaeological History, house patterns, village levels, and burials "in situ", nothing like it has been at-

tempted to date. All members agreed it was an honor and a privilege to be among the first to view this film and to have Mr. Dury's excellent account of the "Turpin Indians."

C. L. Gschwind, Corres. Sec.
6931 Diana Drive,
Cincinnati 24, Ohio

(Editor's Note:—Readers of *Rocks and Minerals* who are further interested in archealogical work at the Turpin Site near Cincinnati can obtain more information and pamphlets by writing Mr. Ralph Dury, Director Cincinnati Museum of Natural History, 1104 Walnut St., Cincinnati, Ohio.)

Gem Collector's Club
(Seattle, Washington)

Members of the Gem Collector's Club are actively engaged in making trips, either singly or in parties, to many mineral localities throughout the West, in search of specimens. As a whole, reports indicate that these ventures were quite productive; only in a few instances were rockhounds out for nothing but a ride.

Picnics shared in interests of the local enthusiasts. On August 8th, the Tacoma Agate Club were hosts to other nearby societies, at Saltwater Park. About 150 attended, including members of the clubs in Everett, Seattle, Tenino as well as the Tacoma people, and possibly some from other clubs not registered. A raffle furnished many fine specimens to the lucky ones. So also did give-away material provided by Mr. and Mrs. Landon, Mr. and Mrs. Goodman, Mr. and Mrs. Leader, and Mr. and Mrs. Foss.

Lapidary groups of the Gem Collector's Club met at the home of Mr. and Mrs. Kietz, in Bellevue, on August 1st. This picnic was greatly enjoyed, the Kietzes being genial hosts. So also with Mr. and Mrs. Fincke, who entertained lapidaries on October 3rd, at their home near Pine Lake; a pot-luck dinner leading off to an evening of much fun and many accounts of collecting trips.

Since the club meeting of September 21st, another series of busy sessions is scheduled for the members. Within the society there are two lapidary groups, two jewelry units, and a mineralogy study group. Only a few clubs can match this number of classes of those who have special features of our hobby to follow up.

Lapidary groups meet on the first Tuesday of the month, one of these being led by Mr. Fincke, the other by Mr. Yerkes. On the second Tuesday of the month, the jewelry unit meets at a member's home, and is directed by Mr. Berry. Unit No. 2 is led by Mr. Wells, wth members of this unit, like all the others, assembling at various homes during the year. Dates and similar information about the mineralogy group have not been announced as yet.

During the meeting of October 19th, club business was held to a minimum, because of a lengthy feature of the evening's program. Only two matters were considered: What was to be done about delinquent members, and whether or not commercial dealers should be chosen as officers of the club. The majority voted in favor of this motion.

The speaker, Dr. Pfifer, professor of geology at the University of Washington, related experiences made during the years he was in Africa, engaged in solving engineering problems for the De Beers concern. Dr. Pfifer compared the use of modern machinery with methods followed in earlier periods of mining history. Handwork is still required in many steps in the whole process, which even yet contains traces of past days.

Because of the deserts in which mines are located, and the distances from populated cities diamond corporations manage truck farms, orchards, amusement centers, and other enterprises which are not what might be expected of those in charge of operations, strictly speaking.

Pictures of the compounds, of the diggings, and of miners at work, completed Dr. Pfifer's account. It is easily seen why many years of experience must lie behind those who do the sorting, grading, and appraising of diamonds for sale to the public.

Paul H. Soll,
9020 32nd Ave., S. W.
Seattle 6, Wash.

San Antonio Rock & Lapidary Society

San Antonio, Texas, has finally gotten on the ball and we now have a San Antonio Rock and Lapidary Society which meets on the second Monday of every month at 8 p.m., in room 1, Downtown Division of Trinity University, 117 W. Crockett St. Anyone interested in rocks, minerals or Lapidary is invited to join us. The dues will be $2.00 per year.

The organizing meeting was held on the 7th of November and Mr. Raymond L. Rock was elected President; Mr. R. B. Perry, Vice-President; Mrs. Lela S. Karwiel, Secretary-Treasurer; and Mr. Jesse Burt, Mr. R. M. Lawson and Joe Murphy were elected the Directors.

The purpose of the Society will be to promote the exchange of knowledge and information within the membership so as to improve the members in the art of rocks and lapidary and to promote the rocks and minerals of the Great State of Texas. We want everyone to know that in Texas we have as much, as good or better rocks and minerals as can be found anywhere else.

The members of the San Antonio Rock and Lapidary Society wish to extend to all an invitation to visit with us anytime you are in Texas. We also wish that the coming year will bring to you many happy hours of good hunting and good luck.

Lela S. Karwiel, Sec'y
723 Steves Avenue,
San Antonio 10, Texas

Mineralogical Society of So. Nevada

Mr. Charles T. Baroch in his discussion of the activities of the Bureau of Mines before the members and guests of the Mineralogical Society of Southern Nevada, Inc., stated that the Bureau of Mines was formed because there was a definite need for that type of organization. In the pioneer days people had everything to themselves. As the country grew, the resources were gradually depleted. A program of conservation was initiated to protect our forests, natural beauty spots and minerals. In order to adequately care for these things, the establishment of Bureaus became a necessity. Taxation also came with the organizations, and of course, dispute regarding the amount of money any one Bureau may spend still goes on. Some who have spent considerable time in the service of the Bureaus feel their existence is justified because of their great utility. They preserve for posterity as well as accelerate the expansion of our country.

A series of disasterous mine explosions in the East precipitated the birth of the Bureau of Mines. On May 16, 1910, an act of Congress provided for this Bureau, giving it the power to supervise mining operations and to oversee the development of coal mining. Amendments in 1913 and 1915 expanded their power to include Metal Mining and Metallurgy and the opening of experimental stations respectively. Today the Bureau exists as a well organized branch of the Department of the Interior, with seven divisions to effect a more efficient handling of the many ramifications of its work.

The Administrative Department handles information requested by or prepared for the general public. The Fuel and Explosive section studies problems in connection with the types and uses of various kinds of explosives. The Department of Economics and Statistics is of major importance because they prepare and edit the publication, MINERALS YEAR BOOK. This volume is invaluable to prospectors and industry alike. Mr. Baroch cited several instances in which the use of this book saved persons, including himself, untold expense, loss of time, to say nothing of the discouragement in launching on what would have inevitably been an unsuccessful mining venture. This Department also compiles data on production, imports and exports with the exception of steel. The Health and Safety Division proposes and develops methods for safer mining procedure and also attacks the problems of national health. The last two Divisions, Mining and Metallurgy, are of prime importance to us in the West. Miners turn to this department for assistance with their problems. It also experiments with, improving where possible, mining equipment, mining methods and timbering. In addition, they do research work on new ore processes, the results of which are made available to the public. Currently, they are attempting to devise a means of radio communication for underground use. In the event of a cave-in, the trapped workers would be able to contact the outside. We all know what this would mean to mining.

The Boulder City Pilot Plant is a branch of the Metallurgical Division which is spread country wide on a geographical basis. There are ten of these Stations taking in the U. S. and Alaska, located at: Albany, Oregon; Boulder City, Nevada; Salt Lake City, Utah; Tucson, Arizona; College Park, Maryland; Minnesota; Tennessee; North Carolina; Alabama and Alaska. The Station at Albany, Oregon, takes in the states of Oregon, Washington, Idaho and Montana. The Boulder City Station covers Nevada and California, while the Station at Salt Lake City cares for the states of Utah, Colorado and Wyoming. The Stations at Redding, California, and Boulder City are situated near large power plants, Shasta Dam and Boulder Dam respectively. This equips them to work in the Electro-metallurgical field. The Metallurgical Division also has a field office at San Francisco where Liaison Officers are employed to contact industry to learn the needs in that area.

The Bureau as a unit has a twofold purpose. The methods of mining are studied and improved with accent on safety and working conditions. The treating of ores and various processes are investigated with experimental work very often yielding revamped or completely new methods, allowing industry to begin an economical commercial production. Additional work in testing coal and other fuels is also conducted. It must be remembered that the Bureau of Mines does not encroach upon any state law or regulation covering safety. The Bureau merely makes suggestions and recommendations which industry may or may not put to use, depending on the receptiveness to new or revised measures.

The general purposes of an experimental station include rendering service to the public and offering solutions to problems brought to their attention, acting as a field laboratory in conducting investigations and requesting funds to conduct experimental work. This work is assigned thru the Chief of the Metallurgical Division in Washington, D. C. Keeping in mind the fact that the various stations have, over a period years, developed specialized fields, of work, the work is allocated according to its nature. For example, Alabama specializes in iron ore beneficiation, non-metals, clays and building materals, while the Boulder City Station promotes the use of electrical energy thru Electro-metallurgy. Boulder City was spotted as an ideal location for this type of work, for at that time, they were not too sure of being able to dispose of all available power. In the passing of the years, however, we all know there was no difficulty experienced in its distribution.

At this point, Mr. Baroch strongly emphasized the policy of the Bureau in regard to doing assay and consultant work. Frequently

the question is asked, Will you assay these samples for me? The answer is, no. This many times angers people. The Bureau explains there are many people doing this type of work for a living and the Bureau does not wish to compete with them. If the Bureau were to attempt to run all assays requested, there would not be enough Chemists available in the country to do the work. Another frequent question asked is, especially before appropriations are to be voted, What had the Bureau done? The Bureau has handled problems of national welfare, fostered cooperative enterprizes and conducted investigations. Research investigations are founded on two things, a problem and an idea to solve the problem. Here is where the difference between laboratory work and pilot plant work enters the picture. Laboratory work invariably originates with an idea being worked out with test tubes and chemicals, while pilot plant work takes over the idea, after the laboratory is positive that a process has been perfected, and adapts it to equipment suitable for economical commercial use. Research work is not begun unless a specific national problem exists. In the west are wide-spread low grade lead and zinc ores. A process was needed whereby these metals could be recovered economically. The Bureau took over the problem and worked out an electrolytic process which may make these low grade deposits an asset.

During the war years the Bureau was called upon many times to serve in an advisory capacity to the War Production Board and many other Government Agencies. It was their problem also to find substitutes for various critical metals. Thus it was that they developed electrolytic processes for manganese, cobalt, chromium, and presently titanium. These are just a few, as the list of critical metals includes, tungsten, vanadium, zirconium, fluorspar, mica, asbestos, optical calcite and optical quartz.Next in line is beryl, tantalum, and all the lithium metals.

Mr. Baroch also mentioned that new technologies are coming to the fore. There is some national concern in regard to fuel oil supplies as the present supply is not inexhaustable. The Bureau has already begun investigation work to produce oil from oil shale. This shale, which is of eocene origin, is wide-spread in Utah, Colorado and Wyoming. The oil is not locked in the shale. However, the shale contains a carbonaceous material called Kerogen having a chemical composition which when heated "cracks" to a volatile oil having some characteristics of petroleum.

This will not solve the problem by any means, as there is much work yet to be done to develop this oil for use as gasoline, and a laboratory for this purpose has been built at Laramie, Wyoming. Along this same line, another process is being tried by hydrogenating coal. Much of the oil used by Germany in the last war was produced by this method. Again, of course, the big problem for the Bureau is to produce in quantity and economically.

While Mr. Baroch gave detailed information on several of the processes developed in Boulder City Station, he stated it would not be possible to cover all the activities of the Bureau in general as they were so numerous and of such great variety.

At the conclusion of his discussion, Mr. Baroch answered many questions regarding processes and the possibilities of attempting to recover metals which are wasted in our every day living, such as tin.

Guests at the meeting included: Dr. Chester Longwell, Geology Professor and author of Yale University, who is making his home temporarily in Boulder City. Mr. and Mrs. Charles Baroch, Mr. Harry Fuller, Mrs. Leonore Eliot, Mr. George T. Evans, Mr. T. E. Hill, Mr. L. E. Sims, Mr. Orzan Nazer, J. Kimball, all of Boulder City. Also Mr. D. C. Billick of Henderson, Nevada and Mr. N. T. Hilbrecht of Las Vegas.

D. McMillan
Publicity Chairman
Boulder City, Nev.

Cleveland Lapidary Society

At our regular meeting on November 2, 1948, we changed our usual procedure by having an Auction and Swap Party. Our President, Dr. Turobinski, acted as auctioneer and there was never a dull moment during the entire program. Lots of items were sold and many bargains were obtained by the members. After all items were sold, quite a large number reached into their pockets and brought out things they swapped to each other where ever they could find a taker.

There is a small charge for each sale and the Society's treasury profits materially.

One of our members, Ed. Inkley, gave a very interesting ten minute talk on Topaz, the birthstone for November.

Thirty-two members and nineteen visitors were present which attested to the interest in this type of meeting. Six new members were admitted into the Society.

Work is progressing satisfactorily on our exhibit for the Library and we expect 100% response from the exhibitors. This exhibit will be held at Cleveland Public Library (in downtown Cleveland) on the 3rd floor, from December 18, 1948 to January 15, 1949.

Our meetings are held in the Mineralogy and Geology Buildng, Case Institute of Technology, Cleveland, Ohio.

John M. Heffelfinger, Sec.
7619 Redell Ave.
Cleveland 3, Ohio

Mineralogical Society of So. California

Dr. Hoyt Rodney Gale, of the Geology Department of Pasadena City College, was the speaker at the October 11th meeting of the Mineralogical Society of Southern California.

He spoke on "The Meaning of the History of Fossils."

Dr. Gale, a well known authority on California Fossils, is a geologist as well as a paleontologist. His lecture was a most thought provoking and challenging one for his audience. Dr. Gale feels that what you can learn from the past history of life gives clues to something constructive that can be done about the problems that loom very large in our world of today.

He touched briefly on the different points in Darwin's theory of evolution. First heredity —that every living thing reproduces its own kind. Second—that heredity is not perfect—the offsprings are not exactly like the parents and thus new characteristics develop—variants. Third—that there is a tendency of all species to overproduce and thus comes the struggle for existence resulting in the survival of the fittest.

It is at this point that Dr. Gale feels the greatest misunderstandings occur. Many people have naturally assumed that if this be true, if it is a case of the survival of the fittest, then it must follow that the strongest, the most vicious, ruthless and cruel life would be that to survive. Such an idea is repugnant to all who hold life as a much nobler and finer thing. The error here, Dr. Gale feels, is the assumption that this strongest most vicious life is the fittest. He poses the question—what is the fittest.

To answer this question, Dr. Gale has delved deeply into the study of fossils—of life as it was lived and as it progressed throughout geologic time. In the course of this research, he has compiled a number of detailed charts on which he has plotted the main line of evolution, as he terms it, against the scale of geologic time. His findings indicate that it is not the strongest and most vicious life which tends to survive and progress—but in this long scale view, the main line of evolutionary development is characterized instead by life that has the greatest sensitivity, receptivity and adaptability—life that does not become too highly specialized. As an example, he cites the case of the dinosaurs that flourished in Mesozoic times. These giant reptiles possessing tremendous strength and power, looked like ruler of their times and yet today they are extinct—a victim perhaps of their own great strength and size. These types of life Dr. Gale terms variants from the main line of evolution—life types that go off on a tangent, flourish for a time only, finally to disappear from existence while lesser more sensitive and adaptable forms of life continue the smooth main line of life progression.

Dr. Gale believes that such findings have great implications in our own lives. Is it possible that man is becoming a specialist in destruction—is force and might to be the apparent ruler of our times? Is man going off on a tangent away from the main line?

Pauline A. Saylor
Covina, Calif.

Pomona Valley Mineral Club

Forty members and guests of the Pomona Valley Mineral Club enjoyed a turkey dinner at Wilson's Dinner House on Foothill Blvd. Pomona, on Nov. 9th.

A committee of club members decorated the banquet tables with attractive centerpieces composed of desert rocks, plants, and plastic desert figuerines. Handsome place cards featured desert scenes and "desert-rat" nicknames were bestowed upon the male members.

Speaker for the occasion was Mr. H. Stanton Hill of Pasadena City College. Mr. Hill brought with him a large display of minerals to be found in the Mt. Lassen Park area and many diagrams, maps, and books relating to his subject which was, "The Geology of Mt. Lassen National Park". He described the principal volcanic regions of the world and identified the three different types of volcanoes. In his series of gorgeous Kodachrome slides he demonstrated the many outstanding features of Mt. Lassen Park.

Three members of the Pomona Valley Mineral Club accepted the invitation of the Los Angeles Lapidary Society to hear the talk by Dr. J. Daniel Willems on "Faceting," on Nov. 1st.

Several members of the Pomona Club visited the Orange Belt Mineral Society Mineral Show at San Bernardino on Nov. 7th and enjoyed the many interesting and beautiful specimens displayed.

Alice S. Cohoon, Sec.
246 W. Aliso St.,
Pomona, Calif.

Texas Mineral Society

At the Regular November monthly Meeting of the Texas Mineral Society, Dr. Arthur Richards, of the Southern Methodist University Geology Department, spoke and showed color slides of a recent summer trip to the Western mining areas of the United States. Dr. Richards travelled 13,000 miles on this trip and had some very interesting and beautiful slides of both geological and scenic pictures.

The Society met at the Baker Hotel's Peacock Terrace, Dallas, Texas.

Next month members of the Society will exchange gifts, having drawn names at the November meeting. The gifts will of course be rocks.

Ralph D. Churchill
Sec'y-Treas.
2003 Republic Bank Bldg.
Dallas 1, Texas

Feather River Gem & Mineral Society

At the October 14 meeting after a three month summer recess, business was limited to a minimum so that as many as possible of the 60 members and visitors present would have opportunity to tell of their vacation experiences. The guest coming from the farthest distance was Walter Thompson of Nome, Alaska, who started his return trip by plane

the following Saturday. He has promised to bring us some "samples" from the Jade Mountain in the spring.

Charles A. Bush, president, told of his trip to Susanville last July where he viewed the classified mineral collection at the county clerk's office and saw lapidary equipment of members of the Lassen Rocks and Minerals Society. He was invited on a picnic and field trip, and everyone "had a wonderful time," he said.

Bush went on to describe his journeys into Nevada, during which he travelled some 3500 miles. There he met members of the Fallon and Reno rock clubs, and spent a couple of days with the John Callahans of Columbus—once an important mining camp, now a ghost town. Bush brought back many specimens, ranging in size from small turquoise cabochons purchased from a woman lapidary to a huge crystal of smoky quartz he found, which he hopes will prove to be gem quality.

Mrs. Ethel Knox described a hunting trip into the Susanville area. Her husband and daughter returned with deer; but she brought back samples of tourmaline and other specimens.

Mr. and Mrs. Don Parker showed colored slides of their vacation trip. There were pictures of southern California, Nevada, Utah, and many other areas—the Grand Canyon, Bryce Canyon, the Dirty Devil River country, and many local scenes.

Mr. and Mrs. Lee Reeves showed only a small part of their pictures because of limited time, but there were colored slides of their trip into southern coastal Oregon with a stopover at the House of Agates at Eureka. Pictures taken at the Society's picnic and mineral show at Bidwell Bar Park last June were shown for the first time.

Nearly everyone attending this meeting brought dozens of specimens to display and discuss, but one of the most fascinating items was a "picture" Pearl Parker had made of fluorescent minerals. Under ordinary light it looked like a scattering of white pebbles on a framed piece of black velvet; under the mineralight it proved to be red roses surrounded by greenery. The execution of this work was slow and tedious, but results were well worth the effort.

Refreshments were served during the evening, and "Happy Birthday" was sung to Don Parker, who was forced to "make a speech" before he was allowed to blow out the SIX candles (he is a new grandfather) and cut the cake.

At the October 28 meeting a great part of the time was devoted to discussion of the Society's expansion, and a serious effort is being made to secure permanent headquarters for housing of lapidary equipment, where cutting and polishing may be taught as well as geology, mineralogy, and jewelry making.

On Sunday, October 31, field trip chairman F. E. Rankin led some 20 members, guests, and their families, on a hunt for agate, which resulted in plenty of cutting and trading material for all, besides everyone having a hilarious good time.

Adeline Rankin, Sec.
Rt. 2, Box 2105
Paradise, Calif.

Akron Mineral Society

The November meeting of the Society was held at the home of Dr. and Mrs. Omar Fouts, 745 Noble Ave., Akron, Ohio.

A symposium on fluorescence was featured. Mr. Clayton Schnabel presented his famed discourse on "The Light of the World," which was illustrated by many specimens of fluorescent materials, Mrs. H. C. Treese discussed and demonstrated fluorescent and phosphorescent paints and pigments.

Dr. and Mrs. J. L. Haynes, who formerly lived in Trenton, N. J., and who are now living in Wooster, Ohio, were guests at the meeting.

Our Club was renamed, "The Akron Mineral Society" instead of Mineralogical Society.

Mrs. C. R. Violette, Pub. Chr.
392 Reed Ave.,
Akron 1, Ohio

Maricopa Lapidary Society
(Phoenix, Arizona)

The Maricopa Lapidary Society had Mr. and Mrs. Gordon from Long Beach, California, as principal speakers at the November 8th meeting. Mr. Gordon displayed and explained standard and new lapidary equipment. Mrs. Gordon gave an interesting and informative talk on "The Story of Diamonds". In open discussion Mr. Gordon answered questions pertaining to the lapidary art and offered suggestions for solving some of the problems of cutting and polishing.

At the October 11th meeting, Jack Streeter from California gave a resume of his three months trip through South America. He showed specimens of material he brought back and told where they were obtained.

A special meeting was held, Friday, November 26th at the Civic Center. Dr. Woodhouse of the University of California was the speaker.

The December 13th meeting was a pot luck dinner and election of officers.

Olive Miller, Sec'y
3727 E. Van Buren St.
Phoenix, Ariz.

Eugene Mineral Association

The Eugene Mineral Association, Eugene, Oregon, held election of officers Wednesday evening Dec. 1, at Condon Hall. New officers are: President, Roger C. Bale; vice-president, M. G. Woodward; secretary-treasurer, Miss Helen Erickson; custodian-librarian, L. H. Kerlee; board of trustees, F. R. McCabe, three year member; Dan E. Cole, one year member.

Three new members accepted are Mr. and Mrs. Ted Thompson and Joe Chace.

After the business meeting a program was presented by L. B. Kimble, program chairman. George Barton, with the help of F. W. Robinson, demonstrated the use of the Geiger counter.

Doctors were the first to make use of the counter in tracing lost radium. Electrons and atoms, traveling at the speed of light, register first in the long metal tube and as radiation becomes stronger a clicking sound becomes audible through the head phones. Ionization taking place makes the instrument useful to detect the radioactive materials. The cosmic count is first detected and as it approaches the vein or locality of the ore, the counter speeds up in proportion to the richness of the ores of radioactive salts. The needle indicator on the counter points to the approximate grade of the ore but is not an indicator of the richness of the deposit. Radioactive elements that react to the counter are thorium and uranium to name two of them.

Mr. Robinson has used his counter in the Eugene vicinity and has found a slight reaction there. Over in the Boise Basin, in Idaho, there is a distinct reaction in the washed gravels. Reaction is also noticable in some pegmatite dykes. Mr. Robinson noted that during a thunder storm the counter seems to pick up a great deal of static and was not successful to use at that time.

Radioactive materials can be picked up on the counter from as much as fifteen feet even through hard rock. Mr. Robinson's counter is run on several batteries which carry about 600 volts.

Refreshments were served after the meeting to 26 members and 13 guests.

Mrs. Roger C. Bale, Pub.
2099 Riverview St.,
Eugene, Ore.

Southwest Mineralogists

The meeting of the Southwest Mineralogists Inc. was held Nov. 8th, 1948, with a very large attendance.

Two very fine pictures were shown by Mr. Louis Eilers of the Glendale Lapidary Society. The first, Lead Mining (by the Bureau of Mines) showed the St. Joseph Mining Company's operation of their mine in Southeastern Missouri.

The film showed in progression the old time mining methods up to the latest equipment and operating procedures.

The photography was very clear and made one feel as if he was actually in the mine.

Excursions into Science was next shown. It delt with the use of Liquid Air and what it means to mankind.

The Pitts collection of Mineral transparencies from the Academy of Science in San Francisco was also shown. Mr. Pitts has many fine slides equaled only by our own past President, Mr. Albert Hake.

Mr. Green, our field trip chairman, displayed some specimens to show the members what they can expect to find on the November field trip to Bicycle Lake.

The proposed Christmas party was discussed by our program chairman, Frank Tombatore, plans were made for December 13, with a turkey dinner and an exchange of minerals by the members attending.

Connie Trombatore
Corr. Sec'y
338 Pomelo Ave.
Monterey Park, Calif.

Queens Mineral Society

Mr. Segeler was the speaker at the November meeting and his subject was, "Mysteries In A Pegmatite" (Palermo Quarry, N. Groton, N. H.).

Mr. Segeler opened his talk by acquainting the members with the friendly and co-operative nature of Mr. Ashley, who is in charge of operations at Palermo. We also were informed that Mr. Ashley has an uncanny ability to find good mineral specimens right under your feet. The location of the quarry was clearly described and the great number of rare mineral specimens found there was most impressive. The paragenesis and theory of zoning in feldspar quarries were described in detail. Core margins, and the minerals associated with them, were illustrated by drawings, excellent photos in color and mineral specimens. Wulfite, the overlooked iron phosphate, is one of the rare minerals to be found and fine specimens were displayed. The importance of close observation of material at this locality was stressed, since so many good specimens can readily be by-passed. An interesting phase of Mr. Segeler's talk was the disclosure that Zugite, Martinite, and Whitlockite found at Palermo, were one of the same mineral. Mr. Segeler and some of the members exhibited a large variety of excellent specimens from Palermo including several of Brazilianite.

A rising vote of thanks was accorded Mr. Segeler and Mr. F. Schneider who succeeded in producing enlargements of minute crystals to near door-stop proportions, and was also responsible for the "on the scene shots" in the quarry and its approach.

William Stadler, Sec.
153-08 119th Ave.
Jamaica L. I., N. Y.

Dec. 1, 1948

Queens Mineral Society

The program for the December 2nd meeting of the Queens Mineral Society called for the election of officers for the coming year. Elected to the office of President—Mr. H. Vogt; Treasurer—Mr. T. Fredericks; Secretary—Mr. W. Stadler.

Regular business disposed of, the members settled back in comfort for a real treat—The Story of Tungsten—Its History: by Mr. Ed. Marcin. Discussion of the Mineral by Mrs. Ed. Marcin were followed by Tungsten—The Metal; as presented by Mr. C. G. Segeler.

Mr. Marcin opened his discussion with a

preliminary reflection in the ancient history of Tungsten. It was pointed out that research was not orderly and very limited prior to the 18th century. In 1785 Tungsten in the form of a compound became known and was commonly known as tin mineral. During this period, physical distincton was used to name minerals. In 1747 the presence of iron was reported. In 1758 manganese was detected. In 1785 Tungstic acid detected and in 1801 it was called Iron Scheelite. It was completely identified as Wolframite in 1832.

In 1781 Scheele analyzed white spar and detected lime and tungstic acid "heavystone." In 1821 complete description was publicized.

Mrs. Marcin reviewed the more recent or modern history of tungsten and called the members attention to the experience of Dr. Lee, while prospecting in China in 1911. At that time Dr. Lee had occasion to be in the home of a Chinese farmer who possessed a stove made of unusual material. Inquiry by Dr. Lee, brought forth the information that the material from which the stove was constructed was abundant on the property of the farmer. The material is now known as Tungsten. The importance of the English, Chinese, Mexican and South American deposits was covered in detail. We were informed of Tungsten's position in the order of importance and abundance and of its ingenious and acidic nature. Paragenesis mineralizers, catalyst action, accessory minerals, contact metamorphism hydrothermal deposits in quartz. Mesothermal, epithermal and eluvial deposits, crystal systems and chemical composition of the various types of species were discussed. Domestic and foreign localities in Australia, Brazil, Bolivia, Chile, Peru, England, Canada and the Iberian Peninsula were covered, and in conclusion, the observation that coastal deposits of tungsten generally predominated was made by Mrs. Marcin.

Mr. Segeler called our attention to Powellite, from Sanford, Maine, and the presence of small molybdenite crystals in the cavities of Vesuvianite. We were informed that most tungsten is made through the WO_3 route, (hydrogen gas passed over WO_3 in boats). Our attention was directed to the present effort to melt tungsten under vacuum in an endeavor to use lower temperatures to accomplish a melt. The use of tungsten in lamp filaments, and tungsten—carbide tools and their importance to our national safety and progress, together with its applications in the automotive industry, concluded Mr. Segeler's discussion.

The speakers were accorded a rising vote of thanks by the members, and fluorescent display concluded the evening's program.

William E. Stadler, Sec.
1553-08 119th Ave.,
Jamaica, L. I., N. Y.

Los Angeles Lapidary Society

The January 3rd meeting of the Los Angeles Lapidary Society will have as its principal speaker, Mr. Forbes of the Carborundum Company. This should be of much interest to all Lapidaries.

The Los Angeles Lapidary Society, under the able leadership of Ted Schroeder, Pres., and his picked officers and chairmen, is doing very much to advance the study of Lapidary Art for everyone.

Anyone interested is always welcome to the meetings, 1st Monday each month, Griffith Playground, Los Feliz and Riverside Dr., Los Angeles.

J. E. Gaston
3776 Dover Pl.
Los Angeles 26, Calif.

Allanite from Greenland

(Continued from page 35)

An estimated ratio of lead to thorium tends to suggest that the age, using the equation Age $= \frac{Pb}{U + 0.36Th} \times 7600 \times 10^6$ years,[1] of the allanite is somewhere between seven and eleven hundred million years, indicating that the rock is definitely of a Pre-Cambrian age.

[1] Palache, Berman & Frondel, *Dana's System of Mineralogy*, 7th Edition, 1944. Page 617.

History of Hobby House

(Continued from page 46)

change such a common looking room into such a fairy-land of color?"

To this room, The Mystery Room, I charge a small admission fee.

The Hobby House is located on route 13 about 3½ miles south of Reeds Spring, just a short distance from the junction of 13 and route 80, and about 15 miles north of Branson, and Lake Taneycomo.

BUY U. S. SAVINGS BONDS

The Rocks and Minerals Association

(Members All Over the World)

President, Oscar W. Bodelsen
219 E. Main St.
Mt. Kisco, N. Y.

Director of Tours, Richmond E. Myers
Dept. of Geology,
Muhlenberg College, Allentown, Penn.

Vice-President, Ronald L. Ives
Univ. of Indiana, Bloomington, Ind.

Secretary-Treasurer, Peter Zodac
Box 29, Peekskill, N. Y.

Organized in 1928 for the increase and dissemination of mineralogic knowledge

To stimulate public interest in geology and mineralogy and to endeavor to have courses in these subjects introduced in the curricula of the public school systems; to revive a general interest in minerals and mineral collecting; to instruct beginners as to how a collection can be made and cared for; to keep an accurate and permanent record of all mineral localities and minerals found there and to print same for distribution; to encourage the search for new minerals that have not yet been discovered; and to endeavor to secure the practical conservation of mineral localities and unusual rock formations.

Ever since its foundation in 1928, the Rocks and Minerals Association has done much to promote the interest in mineralogy. It has sponsored outings, expeditions, formations of mineralogical clubs and the printing of many articles that have been a distinct contribution to mineralogy.

Those of our readers who are members of the Association can rightly feel that they too were sponsors of these many achievements that have helped to give mineralogy a national recognition. Among your friends there must be many who would like to have a part in the Association's work—to share with you the personal satisfaction, the pleasure, and the benefits of membership. Will you give your friends this opportunity to join the Association by nominating them for membership?

Each new member helps to extend the Association's activities—helps to make your magazine larger, better, and more interesting, and above all assists in the dissemination of mineralogical knowledge.

Some advantages of membership: All members in good standing receive: (1) **Rocks and Minerals,** a bi-monthly magazine. (2) A member's identification card that secures the privileges of many mines, quarries, clubs, societies, museums, libraries. (3) The right to participate in outings and meetings arranged by the Association. (4) The right to display a certificate of membership and to place after their names a designation indicating their membership or to advertise membership on stationery, etc. (5) The distinction and the endorsement which comes from membership in the world's largest mineralogical society.

Mineralogical clubs which subscribe for **Rocks and Minerals** also become affiliated members of the Rocks and Minerals Association and enjoy all the advantages which such an affiliation affords.

A number of clubs hold membership in the Association, participate in the annual outings, and co-operate in many ways in furthering the aims and ambitions of the Association.

Affiliation with the world's largest mineralogical society cannot fail to increase membership, enlarge circles of acquaintanceship, and stimulate a keener interest in mineralogy.